ELECTRICAL REVIEW

Managing Editor: HUGH S. POCOCK, M.I.E.E.

Technical Editor: W. O. FENWICK, M.I.E.E.

Industrial Editor: J. H. COSENS

Technical Consultant: C. O. BRETTELLE, M.I.E.E.

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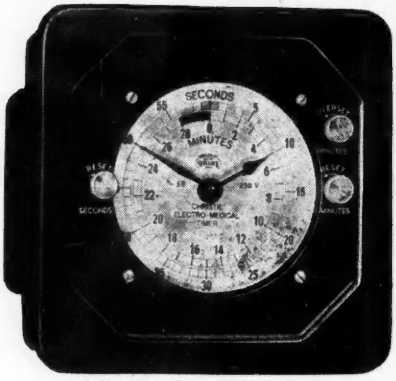

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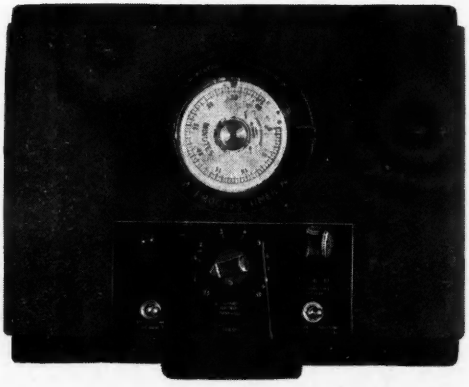

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ELECTRICAL REVIEW

THE OLDEST ELECTRICAL PAPER

ESTABLISHED 1872

Vol. CXLIV. No. 3733

10th JUNE, 1949

Community of Interests

OPPORTUNITIES PROVIDED BY THE CONVENTION

NATIONALIZATION of electricity supply may, in time, settle many irregularities and anomalies, provide service to communities which would otherwise be denied it, and improve it for the rest of the country. If it does not accomplish these things the drastic reorganization of the industry will have been in vain and there will be no remedy.

If nationalization is to fulfil the claims of its advocates, the new authorities must gain and retain the goodwill and assistance of the other branches of the electrical industry. The British Electricity Authority could, of course, aim at becoming self-sufficient by the full use of the very wide powers bestowed upon it by the Electricity Act of 1947. There are many people who could contemplate this with equanimity, or pleasure, but they can have little idea of what is involved. Those who know the structure of the electrical manufacturing industry and are aware that its success depends on continual adaptation to the needs of a rapidly moving world realize that it is a most unlikely subject for nationalization, particularly as a mere adjunct to electricity supply.

Full Employment

We do not think that the B.E.A. itself has any grandiose ideas of this sort. We believe it wants to concentrate on the essential tasks outlined in our first paragraph. Indeed those tasks are likely to need its full attention for many years. Electricity has a very long way to go yet.

There is always a possibility, however, that at some future time those then in control may consider that they could produce their own equipment cheaper (if not better) than electrical manufacturers and rush into the business regardless of the effects upon the national economy and upon export trade (from which the B.E.A. is at present debarred).

Friendliness and Confidence

To guard against this possibility it is necessary that amicable working arrangements and confidence should be established between the B.E.A. and Electricity Boards and the manufacturers. Means of achieving these are already in existence in the form of joint committees composed of representatives of the B.E.A. and of various branches of the electrical industry. It is all to the good, however, that these "bilateral" arrangements are to be supplemented by the British Electrical Power Convention at which all branches will mix and exchange their views and generally get to know one another better.

The Convention will help to dispel the ideas harboured by some in both camps that the interests of the B.E.A. and the manufacturing industry are opposed or, at the best, that they are customers and suppliers, each side being anxious to squeeze the utmost out of the other. They are partners in a great industry and their ultimate interests are identical.

Another important branch of the electrical industry is concerned in all this—the contractor-retailers. For them the

situation is more immediately threatening. The Electricity Boards have inherited installation departments: they are expanding them and preparing to sell appliances in a big way. Must this continue until the private contractor is extinct, or can arrangements be made by which he can still participate in and contribute to electrical expansion? No doubt this will be one of the most urgent topics discussed at the Convention and it may be that the results of the protracted negotiations which have been proceeding will be announced. Nationalization has also raised doubts and fears in other, smaller, branches of the electrical industry and it is to be hoped that the Convention will help to remove them.

CANADIAN BARRIERS

UPON his return from Canada after his three weeks' visit the President of the Board of Trade, said that he had gathered much information to enable him to assess what was required by Canada of British exporters. But even if these exporters comply with the requirements they will still be faced with difficulties which only the Canadian Government can remove. First there are import duties and prohibitions and then if British exporters lower their prices they may find their goods liable to a dumping duty. Apparatus approval is another handicap, as Mr. E. V. Manser showed in our 4th February issue. It will be hard to convince the Canadian authorities that their standards are too high, but there may be cases in which a mere difference in the construction of British appliances does not increase risk of shock or fire. Mr. Manser said that every consideration was given to British apparatus.

PRICE CONTROL

As might have been expected, the Committee on Resale Price Maintenance has found that the control of prices by manufacturers has both good and bad aspects. It does recommend, however, that "sanctions" which go too far should be made illegal, and that collective resale price maintenance should be abolished. The President of the Board of Trade said last week that he intended to invite the principal trade organizations involved to consider the most satisfactory means of ensuring that price maintenance by individual producers should not injure the interests of the consumer. He also thought that the evidence would convince manufacturers and traders that both their own and the country's interests would best be served by freeing distribution from the many self-imposed restrictions and controls mentioned by the Committee.

LAMP BULB PRODUCTION

ONE circumstance which enabled the electric lamp manufacturers to reduce their prices on 1st June was mentioned by Mr. Oliver Lyttelton at the A.E.I. meeting last week. This was the establishment, in conjunction with the General Electric Co., Ltd., of a new company with a factory capable of producing over 200 million bulbs a year. This, Mr. Lyttelton said, would enable bulbs to be supplied to the whole of the country's lamp industry. All this will be accomplished by two "ribbon" machines.

TELEPHONE CHARGES

SIR STAFFORD CRIPPS has found that too much trouble is involved in increasing telephone rentals, as he proposed in his Budget, and so is dropping the idea. He is persisting, however, in his other proposal—to raise local call fees. It is unfortunate that the Chancellor should thus add to "inflationary tendencies" and that a nationalized service, already making a handsome profit, should be used as a revenue-raising device. The excuse is that the increase will help to reduce the pressure of demand. What is needed, of course, is a greater effort to meet the demand.

MORE COPIES OF *ELECTRICAL REVIEW*

The recent decision of the Government to increase the allowance of paper for technical periodicals makes it possible for more copies of the *Electrical Review* to be available commencing on 1st July.

It will still be necessary for an order to be given to your newsagent or for a direct subscription to be placed with the Publishers.

Additional copies will be limited, so order at once if you wish to be sure of copies regularly.

National Supply Survey

ELECTRICAL ASSESSMENT OF THE FOURTEEN AREAS

AS explained in last week's *Electrical Review*, the British Electrical Power Convention, which is to be held at Torquay next week, has supplied us with ready and good answers to the questions: With which Area shall we start the publication of our national supply survey, and at what time?

The 5,500 square miles of the area of the South Western Electricity Board and the South Western Division of the British Electricity Authority, including the whole of Cornwall, Devonshire and Somerset (although the northern boundary of the Division has not yet been precisely defined) is one of the most sparsely populated areas. Yet it ranks high on the "land utilization" map which shows a predominance of meadow land, with a large number of small arable areas in the second place, and with Exmoor, Dartmoor and Bodmin moor as outstanding examples of heathland and rough pasture. The Ministry of Agriculture and Fisheries map shows the two Area ends, east and west, as mainly dairying, while the central south is largely mixed farming and the central north predominantly livestock rearing. Between the last two is another great Devonshire dairying area.

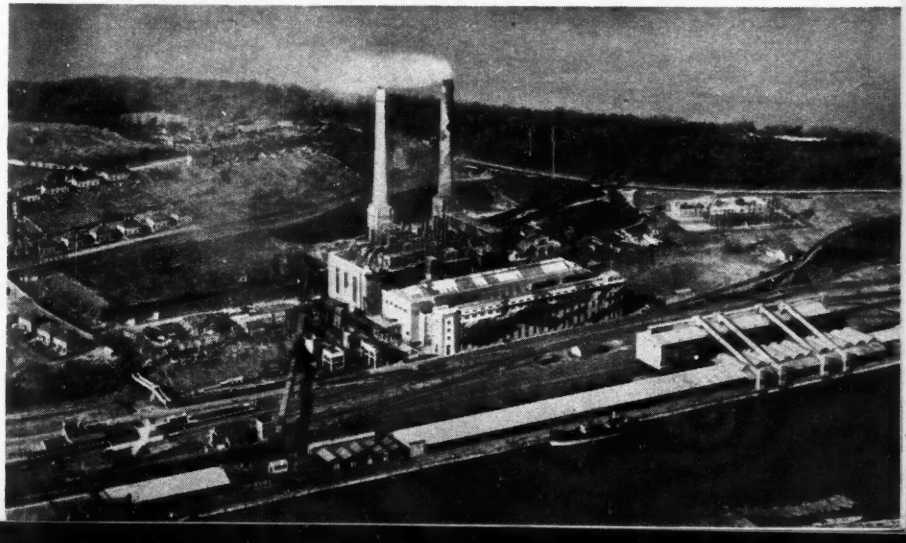
1. SOUTH WESTERN AREA

The population density map shows the bulk of the Area as in the dense rural range, with 50 to 400 inhabitants per sq mile. There is not a great deal of land in the sparse rural range, 1 to 50 per sq mile, but the virtually uninhabited areas corresponding to the heathlands are well marked. The urban areas account for less than 500 square miles, and most of the townships are in the 400 to 6,400 per sq mile range, and while the urban range of 6,400 to 25,000 is fairly well represented, only Plymouth and Bristol are in the dense urban range of over 25,000 per sq mile. The population of the Area supplied by the Board is 2.06 million.

The only basic industry in the Area is that represented by the coalfield running north to south between Bristol and Bath, extending north of the former and south of the latter. To the south of this field there are a few pits, but they are mostly in the 100 to 500 men range.

An indication of the industry scattered

Portishead power station has a capacity of about four times that of the next largest station (*Aerofilms photo*)



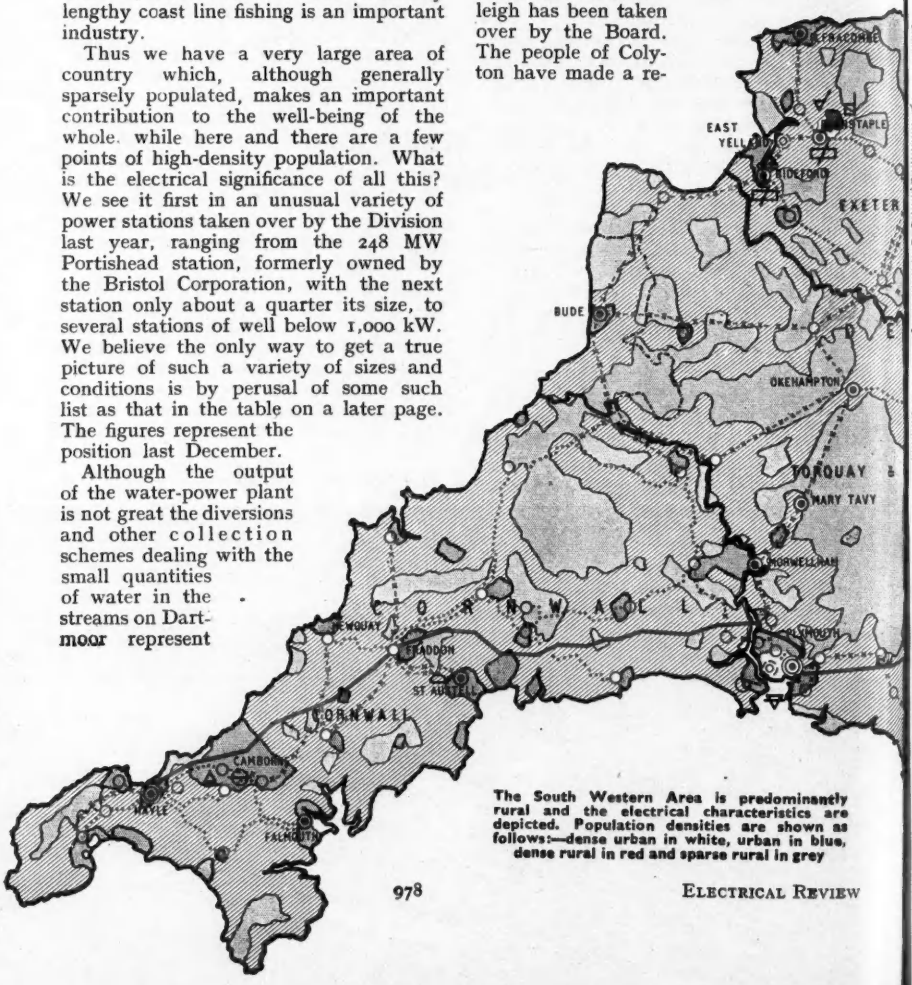
over the Area is as follows: Bristol—the port, aircraft production, engineering, tobacco, chemicals, chocolate, printing paper; Plymouth—shipbuilding; Bridgwater—light engineering, furniture, cellophane; Taunton—shirts; Axminster—carpets; Exeter—clothing, leather goods; Barnstaple—furniture; Bideford—gloves; St. Austell—china clay; Camborne and Redruth—engineering.

There is at present very little activity in the one-time important Cornish tin mining industry. The considerable tourist industry, with which we should couple such names as the Cornish Riviera, Torquay and Wells Cathedral, should not be omitted, and because of the unusually lengthy coast line fishing is an important industry.

Thus we have a very large area of country which, although generally sparsely populated, makes an important contribution to the well-being of the whole, while here and there are a few points of high-density population. What is the electrical significance of all this? We see it first in an unusual variety of power stations taken over by the Division last year, ranging from the 248 MW Portishead station, formerly owned by the Bristol Corporation, with the next station only about a quarter its size, to several stations of well below 1,000 kW. We believe the only way to get a true picture of such a variety of sizes and conditions is by perusal of some such list as that in the table on a later page. The figures represent the position last December.

Although the output of the water-power plant is not great the diversions and other collection schemes dealing with the small quantities of water in the streams on Dartmoor represent a very high degree of enterprise against odds. Two power stations are at present under construction in the area—East Yelland between Barnstaple and Bideford, and Plymouth "B," both of 180 MW ultimate capacity, while a third, of double this size, is planned for a site at Portishead, near Bristol.

Lists of statutory undertakings and service centres taken over by the Board are given in Appendix I and Appendix II, respectively. The undertakings are arranged in groups under the Sub-Area headings. The following non-statutory undertakings are in the Area: St. Mary's (Scilly), Polruan and Colyton, while an earlier one at Chumleigh has been taken over by the Board. The people of Colyton have made a re-



The South Western Area is predominantly rural and the electrical characteristics are depicted. Population densities are shown as follows:—dense urban in white, urban in blue, dense rural in red and sparse rural in grey

quest to the Board for a mains supply. There is an extraordinary range of tariffs for all classes of consumers; there are, or were, 289 all told. These include 72 up to 1d per kWh, 113 from 1d to 2d, 21 from 2d to 3d, 25 from 3d to 4d, 12 from 4d to 5d, nine from 5d to 6d; and 37 from 6d to 7d. Only 119 are two-part tariffs — 21 domestic up to 1d, 36 domestic from 1d to 2d, 16 business up to 1d, and 466 business from 1d. to 2d. Before the Board introduced its first tariff adjustments, fixing a maximum of 7d per kWh for flat-rate tariffs, there were 20 separate tariffs in excess of 7d

JUNE 10TH, 1949

per kWh, the highest being 11.7d per kWh.

How are the many and varied aspects referred to in the foregoing to be welded to give efficient operation under the control of the Board and Division, with the broader national control? The Board organization is being built up on the principle that it must pay its way as it goes, i.e., the Board is to be a trading concern. The organization "tree" on next page has been simplified for practical reasons, but in conjunction with the written notes and the map it will help to show how the needs of the Area, with its very low population density, are to be catered for. The Sub-Area managers, being in charge of administrative units, have direct access to the chairman and deputy chairman of the Board. The dotted lines indicate how the functional services of headquarters and the Sub-Areas are linked together.

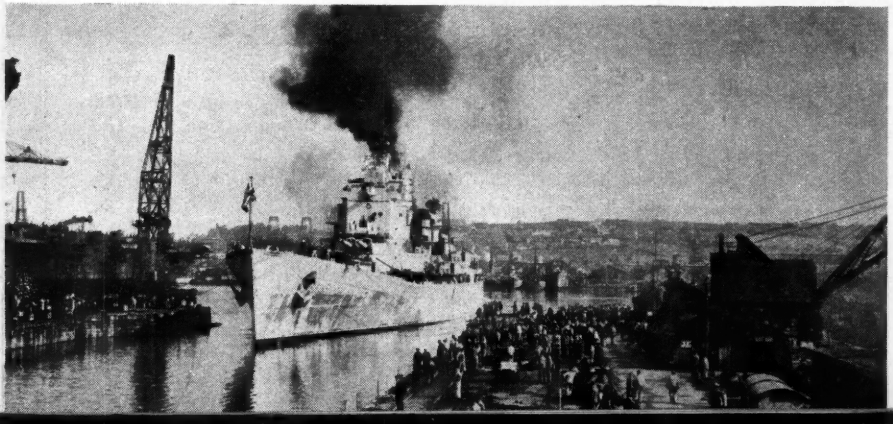
Station	Former Owners	Installed plant cap. MW	Effective sent out cap. MW	Type	How Operated (Shifts per winter day)
Barnstaple	Barnstaple Corp.	2.12	2.0	oil	1—2
Bath	Bath Corp.	20.0	16.0	steam	2
Beasley	Exe Valley Co.	.066	.06	water	—
Bideford	Bideford Co.	1.135	.87	oil and gas	1—2
Bridport	Bridport Corp.	.936	.906	oil	1—2
Brixham	Brixham Co.	.34	.13	oil	1—2
Bude	West Devon Co.	.46	.38	oil	1—2
Castle Meads	Gloucester Corp.	40.075	38.0	steam	2
Chagford...	West Devon Co.	.026	.021	water	—
Exeter	Exeter Corp.	13.5	12.0	steam	2
Falmouth	Falmouth Co.	.24	.03	steam	1—2
Feeder Road	Bristol Corp.	31.778	24.0	steam	2
Hayle	Cornwall Co.	47.8	45.0	steam	3
Ilfracombe	Ilfracombe Co.	.706	.62	oil	1—2
Kensham	Culm Valley Co.	.032	.032	water	—
Lynmouth	Lynton & Lynmouth Co. ...	.512	.388	water and oil	3
Marytavy	West Devon Co.	3.892	3.14	water and oil	1—2
Minehead	Minehead Co.	.765	.55	oil and gas	1—2
Morwellham	West Devon Co.	.7	.62	water	1—2
Newton Abbot	Torquay Corp.	51.825	48.0	steam	2
Okehampton	West Devon Co.	.175	.175	oil	1—2
Plymouth	Plymouth Corp.... ...	65.7	51.0	steam	3
Portishead	Bristol Corp.	248.15	233.0	steam	3
St. Austell	St. Austell Co.	1.057	.91	oil	1—2
South Molton	Exe Valley Co.	.285	.25	water and oil	1—2
Taunton	Taunton Corp.	3.0	2.85	steam	1—2
Weston	Weston-s-Mare Co.	2.6	2.25	steam	1—2

Shift operation shown in the last column does not apply to water power plant which usually runs continuously.

The principals and chief officers are: Chairman, Mr. S. F. Steward, C.B.E.; deputy chairman, Mr. H. Midgley; chief accountant, Mr. C. E. Knight; chief commercial officer, Mr. R. W. Steel; chief engineer, Mr. G. O. McLean; and the secretary, Mr. H. D. B. Wood, O.B.E.

The Board is taking advantage of the possibility afforded by nationalization to centralize those functions which can thereby afford greater efficiency and service to the consumer. For example, by central purchasing they will be able to

Plymouth, with its naval shipbuilding, is one of the industrial centres of the South Western Area (H.M.S. *Vanguard*)

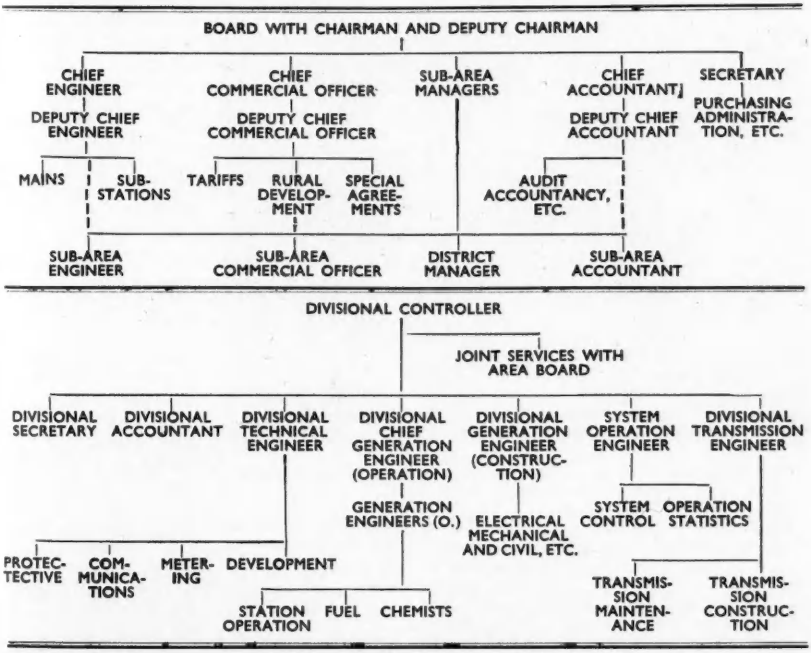


take full advantage of the opportunities for bulk buying and for standardization at considerable saving in cost to the consumer. On the other hand, an extensive survey has recently been conducted to find out what is the most efficient organization for the Sub-Areas, with the result that great

To many, Wells Cathedral characterizes the area

improvements will be made in the service to the consumer by the close preservation of the more local contacts, and by the delegation of the maximum possible responsibility to district officers. In the interests of increased efficiency minor adjustments are to be made to the Sub-Area boundaries.

The Board is fortunate in having as its headquarters the modern and spacious building, Electricity House, Colston Avenue, Bristol, which, but for the war, would have been the new headquarters of the former Bristol Corporation electricity undertaking, and which, when it is completed, will also be used to accommodate the Bristol Sub-Area headquarters and the Bristol Service Centre.



These Board and Division organization trees help to show how the problems associated with very low population density are being catered for

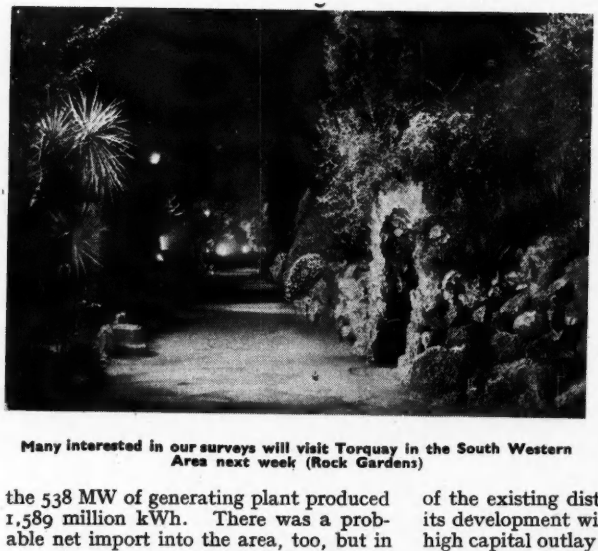
Similarly, the simplified Division organization "tree" printed below, again in conjunction with the map and notes, will show how the other organization in the area is dovetailing its new acquisitions into the national organization to meet the peculiar needs of this specific area. The Division has its headquarters at British Electricity House, 26, Oakfield Road, Bristol, 8, where there is also the control centre for the former C.E.B. South West England and South Wales district.

The principal officers of the South Western Division are: Divisional controller, Mr. J. T. H. Legge; chief generation engineer (O), Mr. G. W. Clarkson; chief generation engineer (C), Mr. J. Irlam; system operation engineer, Mr. L. B. Law; transmission engineer, Mr. S. Hoggart; technical engineer, Mr. T. S. Andrew; secretary, Mr. R. C. Barnett; accountant, Mr. H. K. B. Lund.

We will now attempt to show what service is actually being afforded in the area, and to this end it is necessary to give some of the principal statistics. During 1947 the 538 MW of generating plant produced 1,589 million kWh. There was a probable net import into the area, too, but in the absence of metering at divisional boundaries the best indication we can give of this is that the net import into the ex-C.E.B. S.W. England and S. Wales district, which includes the S. Wales and South Western Divisions and the greater part of the Southern Division (see combined Divisional area and grid control area map in the *Electrical Review* of 3rd June) was 326 million kWh for the year 1947.

During 1948-49 the maximum demand for the Area was 337 MW, while in the same period something like 1,028 million kWh was sold to the 530,000 (approx.) consumers. A rough analysis of this consumption is: domestic, 52 per cent; industrial, 32 per cent; commercial, 15 per cent; farms, 1 per cent.

This survey would not be complete without some word on plans for the immediate future, although so far the Board has inevitably been concerned more with reorganization than with actual development. Before any large-scale development work can be put in hand, it is essential to reinforce and augment the primary 33 kV network, which has received practically no strengthening since 1939. To this end a long-term plan has been drawn up to reinforce and augment the network during the next few years at a cost of £2,000,000.

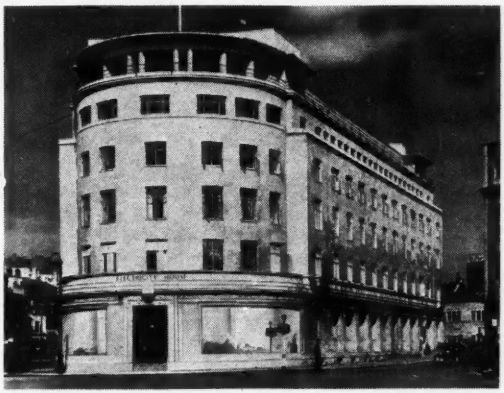


Many interested in our surveys will visit Torquay in the South Western Area next week (Rock Gardens)

A sure indication of the main field of future development is to be found in the fact that out of 34,000 farms and holdings of 5 acres and above, only some 7,000 at present have a supply of electricity. While the more densely populated parts of the Area—which are naturally the more remunerative—have already been connected to the supply, over 55 per cent of the south west is out of reach of the existing distribution network, and its development will necessarily involve a high capital outlay in relation to potential revenue. Recognizing that rural electrification on a large scale will be its major task for the future, the Board is already seeking means of overcoming the complex financial problem—which is far more in-

tractable than the engineering one— and is at present carrying out a survey of the whole Area on which to plan this development on the most economical basis.

We were greatly impressed by a map scheme in this survey, which may be described roughly as follows. Maps of the 11 kV network have been prepared showing (i) by means of shaded circles those localities which are within half a mile, i.e., within easy reach, of existing transformers, and (ii) by means of shaded parallels those areas which lie within half a mile of existing 11 kV mains and are therefore capable of early development. By superimposing overlays showing population densities it will be possible to determine which localities, from both the financial and engineering standpoints, are ripe for development and also those which are only suited to a long-term programme.



The Board is fortunate in having as its headquarters Electricity House, Colston Avenue, Bristol

In the meantime, new supplies are being given within the limits of present restrictions. During the current financial year it is planned to spend £2,000,000 on strengthening the 11 kV network and giving supplies to an estimated 28,000 new consumers—an increase of 4,000 on the total new connections in 1948-49.

We are indebted to Mr. S. F. Steward, C.B.E., Chairman of the South Western Electricity Board, and to Mr. J. T. H. Legge, Divisional Controller, South Western Division, British Electricity Authority, and to some of their principal officers, for their co-operation, particularly in these early days when it is so difficult to collate information which must be drawn from so many scattered points in so large an area.

APPENDIX I

Undertakings

BRISTOL AND NORTH SOMERSET SUB-AREA: Bath, Bristol, Mid-Somerset, North Somerset and Weston-super-Mare.

TAUNTON AND WEST SOMERSET SUB-AREA: Taunton, Bridgwater, South Somerset, Seaton, Minehead, Wellington, Bridport and Lyme Regis.

EXETER AND EAST DEVON SUB-AREA: Exeter, Lynton and Lymouth, Bideford, Exe Valley, East Devon, Ilfracombe, Tiverton, Barnstaple and Culm Valley.

TORQUAY AND WEST DEVON SUB-AREA: Brixham, Dartmouth, Plymouth, Salcombe, Dawlish, West Devon, Chudleigh, Paignton, Plympton, Teignmouth, Torquay, Bude and Holsworthy.

CORNWALL SUB-AREA: Cornwall, Falmouth and St. Austell.

APPENDIX II

Service Centres

Axminster, Bampton, Bath, Bere Alston, Bideford, Bodmin, Bovey Tracey, Bower Ashton, Braunton, Bridgwater, Bridport, Bristol, Brixham, Bude, Budleigh Salterton, Burnham, Callington, Camborne, Camelford, Chard, Cheddar, Chudleigh, Clevedon, Clovelly Cross, Congresbury, Crediton, Crewkerne, Cullompton, Dawlish, Dulverton, Exeter (2), Exmouth, Falmouth, Fowey, Glastonbury, Hatherleigh, Hayle, Helston, Holsworthy, Honiton, Ilfracombe, Kenton, Kensham, Kingsbridge, Langport, Launceston, Lipton, Lostwithiel, Lyme Regis, Mevagissey, Midsomer Norton, Minehead, Nailsea, Newton Abbot, Newquay, Okehampton, Ottery St. Mary, Padstow, Paignton, Penryn, Penzance, Perranporth, Plymouth, Plympton, Porlock, Portishead, Redruth, St. Austell, St. Ives, Salcombe, Saltash, Shaldon, Shepton Mallet, Sidmouth, Somerton, South Molton, Staple Hill, Street, Taunton, Tavistock, Teignmouth, Tiverton, Torpoint, Torrington, Torquay, Wadebridge, Wells, Wellington, Weston-super-Mare, Whitchurch, Williton, Winscombe and Worle.

Flameproof Vulcanizing

IT is announced that the British Tyre & Rubber Co., Herga House, Vincent Square, London, S.W.1, which maintains a fleet of motor vehicles fully equipped for the installation and maintenance of conveyor belts, can now undertake vulcanized repairs and the splicing of joints in deep pits and coal mines. This has been made possible by the company's introduction of a flameproof vulcanizer, which has passed the Buxton tests and is certified as suitable for underground service. Urgent calls from any part of the United Kingdom can be attended to and work on the surface or below ground can be done at any time of night or day.

Views on the News

By REFLECTOR

RECENT notes and correspondence in the *Electrical Review* upon the virtues of electric street traction have strengthened my regrets that London's trams are such a poor argument in its favour. It seems to have been the deliberate policy of the transport authority to persuade the public that the tram is obsolete—as most of the London trams undoubtedly are. The veterans which rattle their way along the Victoria Embankment, where they have their own track, earned their retirement years ago. Although the latest types in use have been in operation since long before the war, they still demonstrate how comfortable tram travel can be. But these are few in comparison with the vehicles taken over by "London Transport" from the London County Council about twenty years ago—and they were no chickens then.

★ ★ ★

A great deal of interest is being displayed in Scottish hydro-electric development, and the North of Scotland Board is showing a good many people round its area. Last week, for instance, members of the Institution of Electrical Engineers were there for their summer tour and a party of sixteen engineers from Belgium, Finland, France, Greece, Spain, Portugal and Sweden made a survey of the principal developments in the Highlands. It will be seen that the list includes countries which have important hydro-electric undertakings, but they evidently think that there is something to be learned from the Board's methods.

★ ★ ★

Anyone who has been "behind the scenes" in canteens and institutional kitchens will have come across cases of appalling mismanagement and maltreatment of electrical apparatus. To combat this, Miss Ester Purvis, who until two years ago was principal of the Cookery and Demonstration Department of the Jackson Electric Stove Co., Ltd., has written a booklet entitled "Large Scale Electric Cooking" (Landwood Distributing Co., Ltd., price 3s). Besides giving a number of recipes with a guide to the approximate quantities of food required per person, the publication includes a model layout of an electric kitchen designed for a high-class restaurant serving 250 lunches and 250 dinners a day, and rules for the care and management of the principal electrical appliances, including roasting, baking and steaming ovens, fish fryers, boiling tables, and tea and coffee boilers. There are also hints on economy and suggested equipment for various sized kitchens. I think that the booklet should be of particular use as a guide to demonstrators who are endeavouring to cope with large-scale catering in the electrical industry.

★ ★ ★

There is a certain amount of justice in the demand of the Flintshire branch of the Federation of Women's Institutes for the reduction of the radio licence fee to 10s for owners of receiving sets in rural areas without electricity although, no doubt, the Postmaster-General will plead "administrative difficulties." The alternative suggestion that radio batteries should be freed from purchase tax is more feasible and is certainly desirable.

★ ★ ★

Ivory tower department: Having read about ten thousand articles, notes and letters fulminating against the "Clow" surcharge during the last six months or so, it gave me great joy to see in the *Nottingham Evening News* a letter beginning: "Much to my dismay I have seen no protests whatsoever in the Press or otherwise regarding the outrageous electricity bills which many people have now received."

★ ★ ★

A man was fined £2 at Rhyl recently for stealing 18s from an electricity meter. He denied that this was theft as the Merseyside and North Wales Electricity Board had owed him the amount, as a refund, for months. He said, "I took part of what they owed me." As he was evidently a "prepayment" consumer, this incident was in no way related to the "Clow" surcharge, of course.

A=TOWN HALL, B=CALLARD'S CAFE, C=GENERAL POST OFFICE,
D=PAVILION, E=E.D.A. EXHIBITION, F=MARINE SPA

Torquay Convention

ABOUT 1,300 delegates will be attending the British Electrical Power Convention at Torquay next week. Apart from the British Electricity Authority and the fourteen Electricity Boards, eighteen organizations will be participating. All these, with the exception of the Isle of Man Electricity Board and the Douglas Corporation electricity undertaking, are represented on the Council, the members of which are: Lord Citrine, President; Sir William Walker, Mr. V. A. Pask, Mr. F. W. Lawton, Mr. H. J. Randall, Mr. S. F. Steward, Mr. C. R. King and Mr. J. Eccles (B.E.A. and Area Boards); Mr. J. R. Beard (Association of Consulting Engineers); Mr. R. Lee (E.R.A.); Col. B. H. Leeson (B.E.A.M.A.); Mr. R. A. S. Thwaites (E.D.A.); Mr. E. G. Batt (British Refrigeration Association); Sir John Dalton (Cable Makers' Association); Mr. W. J. Jones (Electric Lamp Manufacturers' Association); Dame Caroline Haslett (Electrical Association for Women); Mr. L. C. Penwill (Electrical Contractors' Association); Mr. A. B. Wildsmith (Electrical Wholesalers' Federation); Mr. J. F. Wallace (Employees' National Committee); Mr. C. M. Cock (I.E.E.); Mr. P. V. Hunter (National Register of Electrical Installation Contractors); Mr. J. H. Erskine (North of Scotland Hydro-Electric Board); Mr. W. J. McC. Girvan (Electricity Undertakings in Northern Ireland); Mr. K. J. McKillop (Water-Tube Boilermakers' Association); and Mr. J. W. Simpson, secretary.

An exceptionally full programme has been arranged. Delegates' badges will be issued from 10 a.m. onwards on Monday from the convention office at the Pavilion. Some of the Rotarian delegates will be attending the lunch of the Torquay Rotary Club at 1 o'clock on Monday at Callard's Café. At 4 p.m. the electrical exhibition which the British Electrical Development Association has organized on behalf of the Council at the North Quay will be opened by the President, Lord Citrine, chairman of the B.E.A. and president of E.D.A.

On Monday and Tuesday separate meetings of the B.E.A. and other associations will be held. On Tuesday evening there will be a reception by the Mayor and Mayoress of Torquay. Official business starts on Wednesday morning at the Pavilion at 10.30 a.m., when delegates

will be welcomed by the Mayor of Torquay. This will be followed by the presidential address by Lord Citrine. In the afternoon Mr. C. T. Melling, chairman of the Eastern Electricity Board, will present a paper on "Meeting the Needs of the Consumer in the Electricity Supply Industry." At 4 o'clock the ladies are invited to meet Lady Citrine at tea at Torre Abbey. A reception by the President and Lady Citrine will take place in the evening at the Assembly Hall.

Four papers on technical subjects will occupy Thursday morning and afternoon. "High Voltage Transmission in Great Britain" is the title of the first paper by Mr. T. G. N. Haldane, President I.E.E. This is followed by "Switchgear for Systems of 200 kV and Above," presented on behalf of switchgear members of B.E.A.M.A. by Col. B. H. Leeson, director of B.E.A.M.A. A complementary paper prepared by B.E.A.M.A. transformer makers on "Power Transformers for Systems of 200 kV and Above" will then be read by Mr. H. S. Holbrook, the final subject being "High Voltage Research and Development in British Cable Making Industry," prepared by the Cable Makers' Association and presented by Mr. T. R. Scott. The Electrical Association for Women is holding a luncheon at the Grand Hotel.

The Prime Minister, the Rt. Hon. C. R. Attlee, will be the principal guest at a dinner on Thursday at the Grand Hotel.

"The Electrical Contractor's Place in the Industry and His Service to the Public" is the subject of the final paper, to be read by Mr. P. G. Wallis, vice-president of the E.C.A., on Friday morning. The general meeting is at noon.

Power Convention Exhibition

COMPREHENSIVE DISPLAY OF ELECTRICAL APPARATUS

With about twenty more stands than at last year's I.M.E.A. Convention the Electrical Exhibition which the British Electrical Development Association has organized on the North Quay, on behalf of the British Power Convention Council, provides an even more comprehensive display of electrical products than usual. It is open from 10 a.m. to 6 p.m. from Monday to Friday, and is reserved for delegates only on Monday and Tuesday.

Aidas Electric, Ltd., Sadia Works, Rowdell Road, Northolt **(Stand 3).** "De Luxe" models of "U.D.B." water heaters, designed for export but now available to the home trade, are finished in white stove enamel with two decorative bands of blue. The element covers are replaced by new flush covers in modern style. The exhibit also includes coal-electric types and new models with self-contained ball tanks.

Arrow cooker control unit

Arrow Electric Switches, Ltd., Hanger Lane, London, W.5. **(Stand 64).** — Rotary switches in sizes from 5 to 35 A include units arranged for flush mounting. Q.m. & b. tumbler switches in sizes from 3 to 60 A 250 V are suitable for controlling all domestic appliances and fractional h.p. motors. All the components of an improved cooker control unit are built into one porcelain base. Water heater control units in a variety of styles are available with or without pilot lights. Rotary cooker switches of the 3-, 4-, 5-, 6- and 7-heat types are shown with various types of handles.

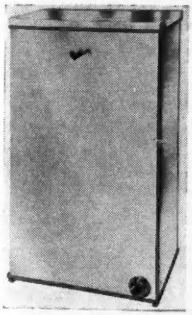
Austin Crompton Parkinson Electric Vehicles, Ltd., Longbridge Works, G.P.O. Box 41, Birmingham **(Electric Vehicle Exhibit.**—A 10-cwt "Morrison-Electricar," fitted with standard fully enclosed body and equipped with a 30-cell 240-Ah battery has a range of 36 miles per charge.

Automatic Telephone & Electric Co., Ltd., Strowger Works, Liverpool, 7 **(Stand 68).**—Animated load curves illustrate the advantages of the "Rhythmatic" ripple control system in reducing load at peak periods and in building load in off-peak periods. A replica of an A.T.M. supervisory remote indication and control installation as applied to the control of an electricity distribution network is demonstrated.

Backer Electric Co., Ltd., Fitzwilliam Road, Rotherham **(Stand 40).**—Particular attention is drawn to the speed, flexibility and high efficiency of the "Backer" 87BT

multi-heat boiling plate. A new 6¼in 1,250 W plate has 900 W of the loading concentrated within a diameter of 4½in so that small utensils may be used with speed and economy. Completing the display are a 1,500 W kettle element, immersion and industrial heating elements.

Bastian & Allen, Ltd., 11, Bedford Square, London, W.C.1 **(Stand 12).**—Electrode hot water and steam boilers embody a new proportionate type of load control which is sensitive to pressure and which varies the electrical input accordingly, and thus virtually anticipates the steam demand. Hot water boilers with hydraulic load control save both space and labour. Storage water heaters include pressure, displacement and gravity types. Among immersion heater elements for domestic and industrial use are new 2 kW and 3 kW automatic models.



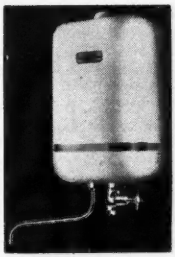
Belling clothes drying cabinet

Belling & Co., Ltd., Bridge Works, Southbury Road, Enfield **(Stand 28).**—New products are a plate and dish warming cabinet, a clothes drying cabinet for the small home, a portable towel airer and a twin boiling plate. A full range of domestic cookers includes a de luxe model with inner glass oven door and illuminated oven, standard models, a "Baby Belling," and a table cooker.

Benjamin Electric, Ltd., Brantwood Works, Tariff Road, London, N.7 **(Stand 17).**—The comprehensive range of industrial lighting reflectors is finished in special "Crysteel" vitreous enamel. "Fluroliers" include the latest type "FF" with slots in the sloping faces of the reflector to give a component of upward light, and also type "F" with a new visor cover. Photographs illustrate "Fluroliers" installed in continuous runs. The "Saaflux" system of reflector construction is shown on a sectioned unit. A valuable collection of lamps from the earliest times includes an oil lamp of 600 B.C.

Benjamin "Fluroliер" with earthenware oil lamp of 600 B.C.

Berry's Electric, Ltd., 85-86, Newman Street, London, W.1 **(Stand 36).**—This exhibit is confined to thermal storage water heaters. A new 1½ gal. unit departs from the normal cylindrical pattern and is streamlined to conform to modern design. It is finished in cream enamel and in two alternative pastel colours. A night load capacity storage heater incorporates a motorized valve. The "Fuelec" operates either with a solid fuel boiler or independently.



Berry's 1½ gal. streamlined water heater

Best Products, Ltd., Felix Works, Felixstowe **(Stand 21).**—A new 2½-pint coffee percolator gives instantaneous percolation, and has a thermostatically controlled "keep hot" device. The 500 W immersion type heating element has a safety device. A 3½-pint 1,250 W kettle, automatic and non-automatic kettle elements of 700 W and 1,250 W loadings, and 2-pint 700 W and 4-pint 1,250 W electric jugs can also be seen on this stand.

Coffee percolator (Best Products)

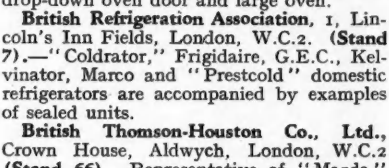
Geo. Bray & Co., Ltd., Leicester Place, Blackman Lane, Leeds, 2 **(Stand 32).**—A selection of "Tubalox" sheathed wire is shown with strip, ring and pad type elements. The company also has on view quantity-produced insulators made to precision limits. Telecommunication apparatus insulators, capacitor dielectrics, and refractory supports and tubes for temperatures up to 1,600 deg. C for radio valves, cathode insulators, thermocouples and pyrometer leads are specialities.

British Insulated Callender's Cables, Ltd., Norfolk House, Norfolk Street, London, W.C.2 **(Stand 22).**—Different types of joint box compound are shown, together with a length of polythene cable in one of the new pressed-copper boxes where the lead sheathed mains only are plumbed. The "Bimec" fault locator detects short circuits and traces unknown cable routes.

British National Electrics, Ltd., Newarthill, Lanarkshire **(Stand 78).**—The manner in which the easy interchangeability of components enables the C.49 cooker to meet a very wide range of domestic needs is demonstrated. Other features emphasized are the two-toned ivory finish, the drop-down oven door and large oven.

British Refrigeration Association, 1, Lincoln's Inn Fields, London, W.C.2. **(Stand 7).**—"Coldrator," Frigidaire, G.E.C., Kelvinator, Marco and "Prestcold" domestic refrigerators are accompanied by examples of sealed units.

British Thomson-Houston Co., Ltd., Crown House, Aldwych, London, W.C.2 **(Stand 66).**—Representative of "Mazda"



"Mazda" Lantern SL750 fluorescent street lighting

street lighting fittings are the fluorescent lantern Series 750 housing three lamps, a horizontal enclosed lantern accommodating a mercury vapour lamp, sodium open and enclosed lanterns, examples from the "600" series of side-entry lanterns, and two of the "Rural" series. A choke, a transformer and a "Mazda Three" floodlight complete the display.

Bulpitt & Sons, Ltd., Swansea Works, Birmingham, 1. **(Stand 31).**—Among "Swan Brand" appliances and ground base aluminium hollow-ware are a new combined kettle and saucepan, and an electro-plated kettle with a coffee percolator to match.

Burco, Ltd., Rose Grove, Burnley **(Stand 19).**—A spring-loaded lid which opens automatically at the touch of a catch is a new feature of the E 840 wash boiler. The 217 washing machine is hand operated but electrically heated.

Cable Covers, Ltd., St. Stephen's House, London, S.W.1 **(Stand 29).**—A new mid span cable connector mounted under tension in a steel frame is completely automatic and instantaneous in its application.

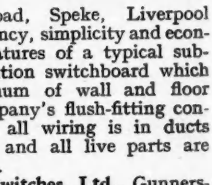
Cable Makers' Association, 52-54, High Holborn, London, W.C.1 **(Stand 8).**—In addition to its display in the exhibition, the Association is staging at the South Devon Technical College, Teignmouth Road, a comprehensive demonstration of scientific apparatus used in electric cable research and experimental work. A 500 kV impulse generator is seen in operation, together with a continuously evacuated cathode ray oscillograph. An electronic surge counter of a new type automatically counts surges of various amplitudes on transmission systems.

Chloride Electrical Storage Co., Ltd., Clifton Junction, near Manchester **(Stand 23).**—Typical cells for power station and substation service, for emergency operation and for the lighting of country residences and farm houses are displayed. A cut-away cell shows the internal construction of an "Exide-Ironclad" traction bat-

E. K. Cole, Ltd., Southend-on-Sea **(Stand 70).**—Although new fluorescent developments are stressed, tungsten and special lamps of from 15 to 1,500 W are shown, including new types for train and bus lighting. Applications of the latest "Thermovent" product, "Thermotubes" to church and hall heating are demonstrated.

Crompton Parkinson, Ltd., Crompton House, Aldwych, London, W.C.2 **(Stand 15).**—The new B.1. single-phase two-wire long-range induction pattern watt-hour meter has been designed for consistent accuracy during long service, and varying ambient temperature, with a magnet system

Crompton Parkinson "B.1" house service meter



and overload compensator to ensure good performance over a very wide range of load. A polarized - light microscope has been developed for examining artificial sapphires.

G. P. Dennis, Ltd., Fleming Road, Speke, Liverpool **(Stand 34).**—Efficiency, simplicity and economical price are features of a typical substation l.v. distribution switchboard which requires the minimum of wall and floor space. In the company's flush-fitting consumer control unit all wiring is in ducts inside the cabinet and all live parts are effectively shrouded.

"Diamond H" Switches, Ltd., Gunnersbury Avenue, London, W.4 **(Stand 52).**—New 7- and 9-heat a.c. switches give great flexibility of cooker hotplate control, whilst the latest oven thermostat provides increased sensitivity and longer life.

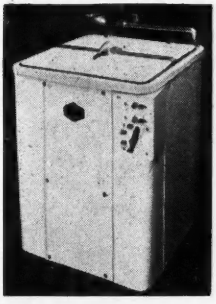
'Diamond H" nine-heat cooker switch

A newcomer to the toggle range is the 30 A 250 V double-pole change-over q.m. and b. switch. A feature of a robust new 30 A 250 V a.c./d.c. packet type switch is the facility to link the various sections internally. Also on show are the latest 3- and 4-heat flush cooker switches with self-indicating handle dials, surface mounting rotary switches from 3 to 35 A 250 V, and a new industrial a.c. rotary flush switch.

Dorman & Smith, Ltd., Ordsal Electrical Works, Manchester, 5 **(Stand 54).**—A skeleton substation switchboard incorporates switches and tag type h.r.c. fuses. Flameproof gear includes a "Diorprism" lighting fitting. A 200 A t.p. and n. circuit breaker has magnetic blowouts, time lags and special coils, totally enclosed. Lighting fittings include the "Diolux" bulkhead unit with a new die-cast case, floodlight fittings, and handlamps. Other items are new 30 A and 60 A short-break switches, fuses, test prods, and an h.r.c. consumer distribution unit. D.S. Plugs, Ltd., show their fused plug and socket range, ring main system, a new 3-way fused and shuttered adaptor and cooker control units. T.p. rotary switches, change-over limit switches, sliding contact limit switches, and push-button units are displayed by British Klockner Switchgear, Ltd.

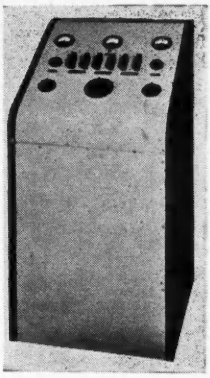
Dowsing Co. (Electrical Manufacturers), Ltd., Kangley Bridge Road, London, S.E.26 **(Stand 47).**—A new domestic dish washer is mounted on castors and no plumbing or other installation costs are involved. Operation is completely automatic and the opening of the cover immediately shuts off the main switch. Thermostatically controlled immersion heaters provide hot water, the washing and rinsing process being performed by means of rotary sprays. Pots and pans, as well as crockery, glassware and cutlery, can be dealt with, and a special knifebox enables bone or plastic handled knives to be washed without damage.

Dowsing dish washer



Edison Swan Electric Co., Ltd., 155, Charing Cross Road, London, W.C.2 **(Stand 18).**—Besides "Royal Ediswan" lamps there is a selection of fluorescent lighting fittings for interior use. Incandescent lighting units include angle dispersive and extensive type reflectors, a prismatic bulkhead unit and a simplified colour blending unit. The "London Minor" lantern is also on view, as well as a modified "Ensure-a-lite" desk pattern automatic control unit for emergency lighting. Tungar battery chargers are also represented as well as "Ediswan" cables.

"Ediswan" desk pattern "Ensur-a-lite" automatic control unit



Electric Lamp Manufacturers' Association, 2, Savoy Hill, London, W.C.2 **(Stand 74).**—This exhibit shows how lighting demonstrations can be incorporated in showrooms. A section of a staircase draws attention to the need for good lighting to minimize accidents in the home and at the same time portrays lighting ideas for cinemas, theatres or commercial premises. Dioramas indicate how lighting has improved in factories and offices and draws attention to the use of colour. A full-scale shop window shows the effect of fluorescent lighting supplemented by incandescent lamps.

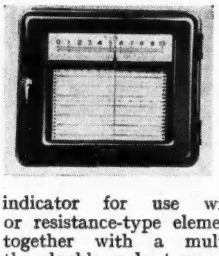
The Electrical Apparatus Co., Ltd., St. Albans **(Stand 50).**—The new EHD house service meter is suitable for fitting to any of the consumer units now on the market. Other new features include replaceable terminal brasses and, if required, an accident proof rotor lifting device. Polyphase and prepayment meters are also shown, an important feature of the latter being the large contactor type switch and adjustable price per unit device. The company produces motor control gear from simple switches to multi-motor control panels. A demonstration set shows the operation of the company's patent single-phasing preventer. Industrial moving iron and moving coil instruments include the "Motammeter" for use with motor control gear.

The Electrical Association for Women, 35, Grosvenor Place, London, S.W.1 **(Centre Stand).**—A special feature of this stand is the first two of a new series of wall charts, entitled the "How to do It" series, showing the correct wiring of various types of plugs, a lampholder, an iron adaptor, etc.

Electrical Industries Benevolent Association, 32, Old Burlington Street, London, W.1 **(Centre Stand).**—The extraordinary increase that has taken place in the amount

spent by the E.I.B.A. on grants to beneficiaries is shown diagrammatically. With a deficit of over £4,000 in 1948, fresh sources of income must be obtained.

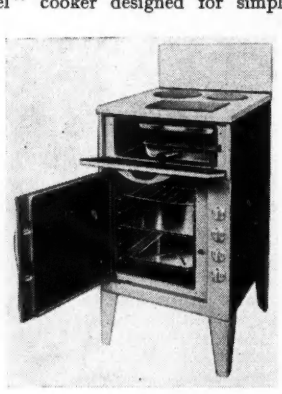
Electroflo Meters Co., Ltd., Abbey Road, London, N.W.10 **(Stand 27).**—Among instruments for boiler and turbine plant is a



Electroflo electronic recording potentiometer

vertical edgewise draught indicator of the diaphragm-operated type. A 10in scale edgewise temperature indicator for use with thermo-couple or resistance-type elements is also shown, together with a multipoint switch of the double pole type with perma-tension contact blades and pure platinum contacts. A new instrument, a 4in edgewise scale indicating thermo-electric pyrometer is particularly useful when a number of continuous readings of temperature are required. An electronic recording potentiometer for the automatic control of superheated steam temperature incorporates only two electronic elements.

Elexcel, Ltd., Victor Works, Broad Street, Liverpool, 14 **(Stand 81).**—A new "Xcel" cooker designed for simple hire



"Xcel" K110 cooker

purposes is available with grill boiler and either one or two boiling plates. Also shown for the first time is a realistic log effect 2 kW reflector fire attractively finished in golden-bronze. One of the two breakfast cookers on view incorporates a 6½in boiling plate as well as a grill boiler and has a pilot light. Two thermostatic irons are available.

Enfield Cables, Ltd., Victoria House, Southampton Row, London, W.C.1 **(Stand 46).**—The future of the super-tension cable at voltages up to 380 kV a.c. and 500 kV d.c. is illustrated by maps, photographs, and recorded descriptions. Stress is also laid on the use of cables for crossing stretches of water. At the Enfield reception room at the Queen's Hotel a working model illustrates the generation of electricity by tidal power and there are displays of 264 kV compression cables, various joints and sealing ends, pole assemblies, feeder pillars, link boxes, and a grid suspension cable.

English Electric Co., Ltd., Queen's House, Kingsway, London, W.C.2 **(Stand 2).**—Items from the company's range of domestic appliances include 2- and 3-plate cookers, a plate warmer with the element sprayed on armour plate glass, reflector fires, a water circulator, and a "Ritemp" washing machine.

Falco Electrical Appliances, Ltd., Coalbrookdale, Shropshire **(Stand 13).**—Drop-down oven doors are a feature of the standard range of cookers which are available with one or two boiling plates and utility drawers at the bottom. The "Junior" cooker has a separate 800 W oven element in addition to the 2 kW grill boiler. A 2 kW reflector fire and a heat-controlled iron are available in various attractive finishes.

Falk, Stadelmann & Co., Ltd., 91, Farringdon Road, London, E.C.1 **(Stand 25).**—The 4-pint "Cleanline" kettle and the "Auto-Perc" coffee maker which makes coffee automatically and keeps it hot until ready to serve are two new "Raydex" domestic appliances. The new "Coolex" 500V isolators and switch fuses incorporate floating copper wiping brushes.

Ferranti, Ltd., Hollinwood, Lancashire **(Stand 5).**—To show the various stages of transformation in the conveyance of electrical power there are scale models of a generator transformer, transmission and distribution power transformers and a 5,000 kVA moving-coil voltage regulator. Sub-station equipment is also represented, together with house service meters, clocks, water heaters and fires.

H. Fisher (Oldham), Ltd., Glodwick Road, Oldham **(Stand 57).**—Special features of the Fisher washing machine are the vitreous enamel tub and top and a visual wringer pressure indicator and safety release. A small drying cabinet dries and airs babies' napkins, etc., quickly and out of sight. Water heaters of various types are available, also immersion heaters and thermostats.

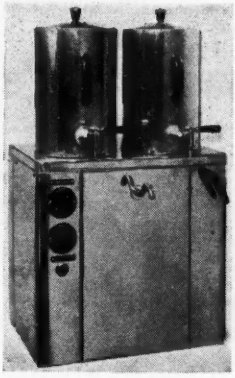
G.W.B. Electric Furnaces, Ltd., Dibdale Works, Dudley **(Stand 56).**—A 30 kW "Autolec" continuous steam raiser gives its maximum output from cold within 5/10

minutes of starting up. Control of pressure and output is entirely automatic. A storage unit, for providing a small amount of steam for sterilizing, etc., is switched on at night, the steam being used during the day. The loading can be adjusted externally from 2 to 6 kW. An electrode water heater, for central heating, is fully automatic.

General Accessories Co., Ltd., Barton Hill Works, Bristol **(Stand 59).**—This company is using its stand as a reception centre for friends. A mobile demonstration unit in the vicinity demonstrates methods of construction and ease of installation of "Clix" electrical accessories.

General Electric Co., Ltd., Magnet House, Kingsway, W.C.2 **(Stand 10).**—The DMH 51 refrigerator (5 cu ft) has provision for ice making and storage of frozen foods, together with a "salador" for keeping salads fresh and a chilling compartment for meat and fish. Cookers include the pale green D.C. 113 three-plate model with drop-down oven door; the new cream and green D.C. 438E two-plate model with side-opening oven door; and the "Bungalow" cooker with grill-boiler, separate lower oven element control and plate warming cupboard. Water heating appliances are represented by a 15-gal. cistern type heater and the 20-gal dual-heat model. Among small appliances are a vacuum cleaner and fires. Decorative fluorescent fittings illuminate the stand.

Gillott Electro-Steam Cookers, Ltd., Cotswold Works, Chalford, near Stroud, Glos **(Stand 76).**—The de luxe model C.1 electro-steam cooker incorporates the latest refinements to ensure efficiency. Cooking and a supply of steam, boiling water and hot water for domestic purposes, baths, etc., are all provided from this one unit. A single stream water boiler for cafés, etc., supplies 120 pints of boiling water per hour.

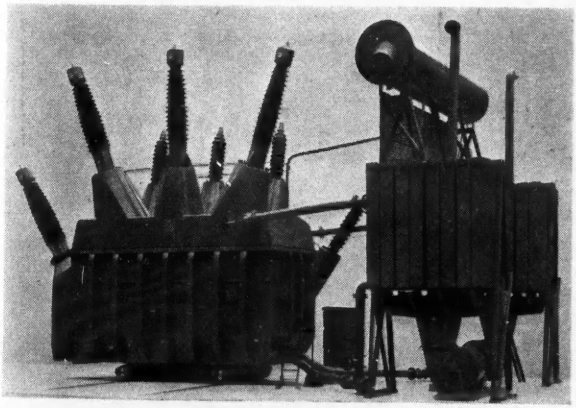


Gillott single stream water boiler

Hague & McKenzie, Ltd., Pyramid Works, Sloane Street, Birmingham, 1. **(Stand 68a).**—"Pyramid" aluminium utensils for hotplate cooking have ¼in bases with sides designed to prevent distortion. Special utensils are made for catering, shipping, hospital and industrial canteen use.

L. G. Hawkins & Co., Ltd., 30-35, Drury Lane, London, W.C.2 **(Stand 55).**—The new "Hawkins-Universal" 10½-pint pressure cooker has specially been developed for electric hotplate cooking. The original "Electric Hostess" food server has been replaced by a more streamlined, more efficient and lighter unit and a new sideboard model is available. Fans of the latest design include a 12½in oscillating model for wall or table use. "Supreme" hairdryers are now produced in an attractive cream finish. The "Tecal" automatic tea-making equipment, "Klampshayds," irons, kettles, gluepots, "Peter-the-Heater" car and cupboard heaters, desk lamps, immersion heaters, and the "De-froster" are also shown.

Heatrae, Ltd., Norwich **(Stand 71).**—Water heaters include a rectangular cistern type pattern, an attractive 1½ gal unit, the "Two-Twenty" with top and bottom heat, and a new rectangular pressure type water heater. For the catering industry there are water, milk and coffee urns and water boilers.



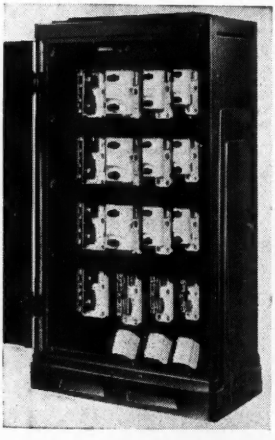
Scale model of a 44 MVA Ferranti transformer for Pyhakoski power station, Finland

Warming plates, a combined towel rail and room warmer, an airing cupboard heater, immersion heaters, a 4 kW self-contained

Heatrae food trolley

oil heater and air heating apparatus can also be seen.

W. T. Henley's Telegraph Works Co., Ltd., 51-53, Hatton Garden, London, E.C.1 **(Stand 72).**—A display of super-tension cables includes a 66 kV 3-core gas



New Henley distribution pillar

cushion cable joint. Photographs illustrate important installations and also the 1,200,000 V impulse plant installed in the Henley Research Laboratories. A new distribution pillar embodies many features making for simplicity and ease of jointing and providing maximum flexibility. The "Dwarf" type pillar demonstrates its usefulness in limited space.

Hindle, Smart & Co., Ltd., 20, Wilmslow Road, Manchester, 20 **(Electric Vehicle Exhibit).**—The Jen Helecs battery-electric articulated tractor has been designed primarily for the delivery of goods in built-up areas. It has a capacity of 2 tons and can be operated with a number of semi-trailers.

H.M.V. Household Appliances, Hayes, Middlesex **(Stand 16).**—Domestic appliances of modern design comprise fires, convectors, kettles, percolators, upright and horizontal toasters, heat controlled and travelling irons, and a hairdryer.

Hoover, Ltd., 211-213, Regent Street, London, W.1 **(Stand 33).**—In addition to the new 612 vacuum cleaner, there is a heavy-duty model for hotels, etc., the "Junior" model for the small home, the cylinder cleaner, and the "Dustette" hand cleaner. Washing machines, fractional h.p. motors, plastic commutators, slide and toggle switches are also shown.

Horstmann Gear Co., Ltd., Newbridge Works, Bath **(Stand 42).**—Among various time switches is the new "K1" 15A synchronous driven unit comprising two dials, one solar and one hand set, and two switch mechanisms. The hand set dial takes care of secondary switching operations between the solar on and off period. Another new produce is a geared synchronous motor unit supplied with a wide range of output shaft speeds. A delay switch for domestic equipment is also exhibited.

Hotpoint Electric Appliance Co., Ltd., Crown House, Aldwych, London, W.C.2 **(Stand 6).** — The "Torribar" automatic safety kettle shown for the first time is a development of the domestic immersion heater. With a loading of 1,500 W it boils three pints in eight minutes. Further applications of "Torribar" elements depicted range from boiling plates to cast-in elements for industrial heating. A "Perspex" encased washing machine, rotary ironer, table ironer, clothes dryer, "Plus Five" and de luxe irons are included in a laundry exhibit. Two fires, a glass-sided toaster and the "clamp-on" type kettle are also shown.

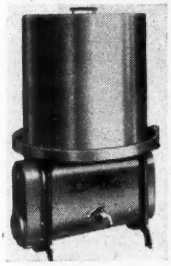
Hotpoint "Torribar" kettle

Jackson Electric Stove Co., Ltd., 143, Sloane Street, London, S.W.1 **(Stand 41).**—With a selection of the latest 190 "Cleanline" cookers is the No. 69 "Giant" cooker, complete with floor stand; and the

903 wash-boiler with a white table top.

Johnson & Phillips, Ltd., Charlton, London, S.E.7 **(Stand 79).**—The recent introduction of a simple wiping technique has hastened the growth of the use of the new seamless aluminium sheathed power cable.

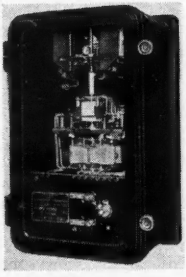
Duncan Low, Ltd., 299, Bell Street, Glasgow, C.4 **(Stand 61).**—Apart from domestic circulators and immersion heaters there are special industrial models including watertight, immersion, submersion and flameproof types. Low pressure fully automatic steam raising units for sterilizing chests, churn stools, etc., produce steam in seven minutes from cold. A small low-loading sterilizing unit for ice-cream containers and utensils can be connected to a 15 A socket.



Duncan Low steam sterilizer for ice-cream containers and utensils

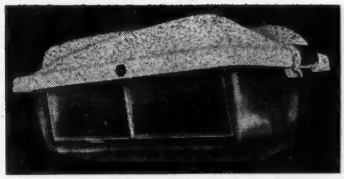
Donald Macpherson & Co., Ltd., 21, Albion Street, Manchester, 1 **(Stand 58).**—In the bowl of an electrically operated fountain standard finishes applied to mild steel plate will be immersed for the whole period of the exhibition. A new type of transformer paint also applied to mild steel is shown immersed in boiling transformer oil continuously.

Measurement, Ltd., Tameside Works, Dobcross, Oldham **(Stand 37).**—Single phase house service meters include types ZE and ZF, the latter employing a modern anisotropic magnet system. A meter is also shown with a new roller index having friction lower than the usual pointer index. Prepayment meters are represented too and a telemetering system is demonstrated.



Measurement EWG telewattmeter

Metropolitan - Vickers Electrical Co., Ltd., Trafford Park, Manchester, 17 **(Stand 80).** — Among products on view are an electrical impulse summator, a single-phase meter testing equipment, a portable substandard wattmeter, a precision watthour meter, single-phase house-service watthour meters, the "S.O. Fifty" all-"Perspex" refractor street-lighting lantern, a side-entry street-lighting lantern, radiant boiling plates and grill boilers, a kettle element, a "Lo-volt" soldering iron and heating elements.



Metrovick "S.O.Fifty" lantern

Moffats, Ltd., Blackburn **(Stand 24).**—The E 42 S cooker has one grill boiler and one 8in boiling plate. A larger version, the E 43 S, with an additional 6in hotplate and a bigger oven, is available either on legs or on a step-in base with a utility drawer. The E 31 S "Table Top Cooker" has three hotplates, covered by a hinged lift top when not in use.

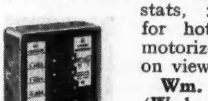
Parnall (Yate), Ltd., Yate, Bristol **(Stand 14).**—Though designed for overseas markets, the E.C.10/12 cookers are expected to find favour in this country. The E.C.5 and E.C.6 cabinet models are so designed that the oven pre-heating time is approximately half that hitherto experienced with electric cookers. The "Silver Grill" breakfast cooker can also be seen.

Premier Electric Heaters, Ltd., Keeley Street, Birmingham, 9. **(Stand 53).**—The "Pylon" kettle, the "Eight-o-Eight" controlled iron, "Laundwell" iron, toasters, coffee percolators, reflector and imitation coal fires are typical products.

Revo Electric Co., Ltd., Tipton, Staffs. **(Stand 11).**—Models in the "Princess" series of cookers include the new 464/D designed for the larger family. The "Chef" breakfast cooker finished in black and cream has a 2.2 kW grillboiler. Other exhibits are the "Dandy" and "Jubilee" cookers, the "Revomatic" heat-controlled electric iron, the "Electrajug" and the "Revomatic" kettle. Specimens of street lighting and industrial lighting fittings are also shown.

A. Reyrolle & Co., Ltd., Hebburn-on-Tyne. **(Stand 69).**—Present trends towards early adoption of 275 kV transmission projects in Great Britain lend added interest to a scale model of a 3-circuit-breaker section of a typical switching-station designed for 275 kV. A low duplicate-busbar layout is shown, with pedestal-mounted switchgear and ancillary equipment; with this gear sectionalizing screens are unnecessary. Examples of pillar-type mining and industrial circuit-breaker panels are also shown.

Rheostatic Co., Ltd., Slough. **(Stand 39).**—In addition to a new water heater immersion thermostat, there is a new range of cooker thermostats which include single circuit and double circuit instruments using a thermal sensitive device of the liquid expansion type. A small thermostat has been developed particularly for the small private greenhouse owner. Various other thermostats, multi-heat switches for hotplate control, and motorized valves are also on view.

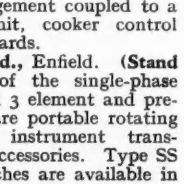


"Sandsbury" consumer's control unit

Wm. Sanders & Co. (Wednesbury), Ltd., Wednesbury. **(Stand 30).**—Three ironclad panels indicate the types of control gear manufactured. One comprises a typical standard busbar chamber with "Superior" switchfuse with sealing chamber and gland, and a "Super-Sandaspeed" distribution fuseboard. The second covers light industrial gear comprising "Sandamax" and "Sandalux" switchfuses and isolators, a "Sandamax" distribution board, an industrial connector set and a range of fuse units. In the third domestic type gear includes a typical metering arrangement coupled to a consumer's control unit, cooker control units, fuses and fuseboards.

Sangamo Weston, Ltd., Enfield. **(Stand 45).**—Besides meters of the single-phase credit, polyphase 2 and 3 element and prepayment types, there are portable rotating sub-standard meters, instrument transformers and metering accessories. Type SS synchronous time switches are available in 5, 10 and 20 A capacities, most models being fitted with a day omitting device and manual operation button as standard. Small synchronous motors for electric clocks, process timers, time switches, etc., are supplied with or without gearing. Laboratory standards, portable instruments, panel and switchboard instruments are available in both moving coil and moving iron pattern. A miniature moving coil relay, a photometer for measuring interior illumination values, a photographic exposure meter and photoelectric cells are other items.

Sangamo SSA time switch

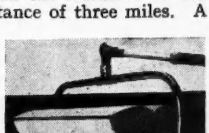


Santon, Ltd., Somerton Works, Newport, Mon. **(Stand 73).**—A greatly extended use of non-corrosive metals in the company's water heaters removes old troubles caused by corrosion of outer casings, and special attention has been paid to improvement of automatic features. Among apparatus of particular interest are a fully automatic 10 gal insulated water boiler of new truncated design, with a new method of positive boiling water control; a 2½ gal floor mounting water heater; a new cistern type heater; an instantaneous geyser, with "Perspex" cover; 20 gal and 40 gal agricultural heaters; a 3 gal urn; a 20 gal bulk boiler; a 4 kW immersion heater 18in long designed to run in air without damage; a portable immersion heater for use in laboratories and for keeping household cold water cisterns from freezing; and a rectangular immersion heater for use in vats.

George H. Scholes & Co., Ltd., Wylex Works, Wythenshawe, Manchester. **(Stand 65).**—"Wylex" electrical accessories include plugs, sockets and switch sockets; 30 A and 60 A d.p. a.c. switches, cooker control units, clock connectors and switch fuse control units. A new ring main dual plug has a novel fuse replacement feature.

Siemens Electric Lamps & Supplies, Ltd., 38-39, Upper Thames Street, London, E.C.4. **(Stand 26).**—Samples of cables include 0.2 sq in and 0.25 sq in conductors laid in one piece from the mainland to the Isle of Wight, a distance of three miles. A new colour-matching unit comprises a trough fitting employing two 2ft 40 W blue fluorescent lamps and two 60 W pearl tungsten filament lamps. The "Sudesco-Sieray" dental unit incorporating two 24in 40 W "natural" fluorescent lamps gives a high concentration of light with remarkably little shadow. Various fittings for fluorescent tubes include a 1½ft unit as installed in various buses and the new snap-on "Perspex" diffusers. Other exhibits are street lighting equipment for mercury, sodium and fluorescent lamps; "Sieflash" tubes for photography and for stroboscopes; consumers' service units; earth leakage circuit breakers and house service meters.

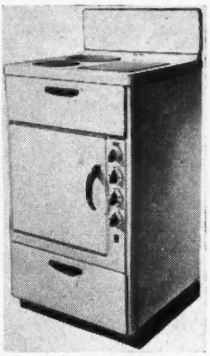
Siemens "Sudesco-Sieray" dental unit



Silent Transport, Ltd., Courtenay Road, Woking. **(Electric Vehicle Exhibit).**—The "Harbilt" electric pram has a payload of 1 ton and a range of 10 miles with full load.

Simplex Electric Co., Ltd., Oldbury. **(Stand 9).**—Notable among "Creda"

appliances are the EV.13 domestic cooker in two-tone ivory finish, kettles, the "Halo" iron, a new wash boiler and a new glass hotcupboard counter display unit. An addition to the range of Simplex switchgear is the 15 A interlocking switch socket.



"Creda" EV.13 Series 2A cooker

Cooker control units and 15 A and 30 A "Regent" switch fuses are also shown, as well as prismatic bulkhead lighting fittings and floodlighting units.

Smith Meters, Ltd., Rowan Road, London, S.W.16 **(Stand 49)**.—A new development is an index of the cyclometer type which conforms to B.S.37.

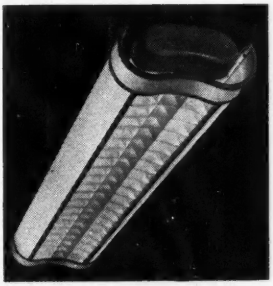
South Wales Switchgear, Ltd., Blackwood, Mon. **(Stand 35)**.—A 400 A 250 MVA 11 kV volt, three phase, A.S.T.A. certified oil circuit breaker is exhibited, with various circuit breaker contacts, arc control devices, isolating contacts and condenser type bushing insulators. A spring closing mechanism displayed may be used with any of the h.v. oil circuit breakers. An outdoor type 11 kV oil immersed switch-fuse unit incorporating h.r.c. fuses up to 250 MVA at 6.6 and 11 kV gives visible indication of isolation and has a three-phase mechanically operated tripping device and an earthed safety shutter. A l.v. circuit breaker of 400 A 25 MVA 440 V rating is also on view, together with photographs illustrating the company's range of switchgear and power transformers.

South Western Electricity Board, Electricity House, Colston Avenue, Bristol. **(Stand 1)**.—Maps, facts and figures indicate the salient features of the south-west from the electricity supply point of view, in particular the amount of development work facing the Board in an area 55 per cent of which has no mains or distribution networks.

Standard Telephones & Cables, Ltd., Connaught House, Aldwych, London, W.C.2. **(Stand 77)**.—A new 50-line private telephone exchange is working with a secretarial telephone system, a visual staff locator and a loudspeaking master station telephone of new design. Remote control and supervisory exhibits include the d.c. bias system of street lighting control, a typical generating station control desk in model form, and a working supervisory system. Rubber and plastic cables are also shown.

Sunvic Controls, Ltd., 10, Essex Street, London, W.C.2. **(Stand 48)**.—In addition to TYC "Simmerstats" incorporated in cookers for hotplate control, there are ERP units with plug bases for connecting to the flexible cable of such appliances as kettles, irons, etc. The ERC for similar use is designed for bench or wall mounting. The TQA water heater thermostat carrying 15 A at 250 V a.c. is suitable for use with a combined immersion or storage heater, and also for mounting as a separate unit. The new T.O. oven thermostat of the stem type incorporates the snap action micro-gap switch used in the "Simmerstat." A flexible drive permits considerably increased freedom in cooker design, and simplifies conversion of existing cookers to thermostatic control.

Thorn Electrical Industries, Ltd., 105-109, Judd Street, London, W.C.1. **(Stand 4)**.—A new twin 4ft 40 W fluorescent unit can be employed alone or with either of two attractive diffusing attachments. The "Atlas" twin and triple tube 30 W units are very suitable for domestic use. A new range of slim control gear is announced. Incandescent lamps include many special types. The "Mary Ann" food mixer and the "Doubleway" heat-controlled electric iron and a new lightweight iron represent domestic appliances.



"Atlas" fluorescent lighting fitting with "Crinothene" louvre attachment

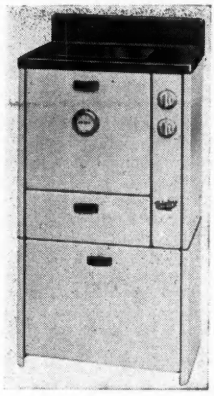
T.M.C.-Harwell (Sales), Ltd., 37, Upper Berkeley Street, London, W.1. **(Stand 62)**.—Among synchronous electric clocks is a new octagonal clock in peach or green mirror glass. It will stand on a mantelpiece or can be hung. It can also be supplied for flush fitting in the wall. Accessories include a shuttered switchplug.

"Temco" No. 633 clock

Tomlinson Electric Vehicles, Ltd., 16, Brownlow Mews, London, W.C.1. **(Electric Vehicle Exhibit)**.—A battery operated truck

has been evolved for use by cable jointers.

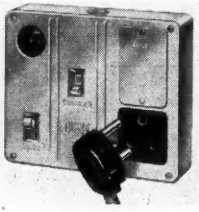
Tricity Cookers, Ltd., 109, Kingsway, London, W.C.2. **(Stand 44).**—The principal exhibit is the new 473A cabinet cooker,



Tricity 473A cooker

a self-contained unit of standard height, with a loading of under 3 kW. Exceptional efficiency is obtained by the use of duralumin reflectors in place of lagging. In addition to a warming cupboard a storage cabinet is provided at the base.

J. H. Tucker & Co., Ltd., King's Road, Birmingham, 11 **(Stand 43.)**—A new a.c. cooker control unit, the standard type of which has a 30 A double-pole a.c. main switch, fused pilot circuit and 15 A fused auxiliary circuit, can be supplied with neon pilot lamp and plain lens, without pilot circuit and with a 13 A flat pin socket-outlet. Other a.c. accessories, embodying the slow break principle, are also shown, together with socket-outlets, including shuttered types;



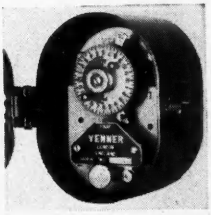
Tucker 30A cooker control switch

q.m. & b. switches, including suspension types; indicating pilot units; a new double-pole a.c./d.c. switched lampholder and an all-moulded batten holder with side-screw terminals giving frontal accessibility; and industrial switches and switch sockets.

Universal Boilers & Engineering Co., Ltd., Fulledge Works, Burnley **(Stand 82).**—The "Versco Major" hand-operated, electrically heated washing machine, and the all-electric flush action washing machine are of especial interest among a display of washing machines and wash boilers.

Vactric, Ltd., Newhouse, Motherwell, Lanarkshire **(Stand 38).**—The R.45 and W.101 vacuum cleaners, a floor polisher, a waxer, and a duster are representative of the company's range of products.

Venner Time Switches, Ltd., Kingston By-pass, New Malden, Surrey **(Stand 51).**—In the range of meters shown are credit, pre-payment, two-rate and dual coin two-part tariff meters with variable fixed charge attachments, and an hour meter for recording the number of hours that a machine or circuit has been in use. Time switches, fitted with solar dials and week-end selective device when required, are available in capacities from 5 to 400 A. Synchronous clock movements are manufactured with output speeds varying from 8 sec to 48 hours. Timers can be supplied in timing ranges from 0-60 sec to 0-40 hours.



Venner 10A synchronous motor driven time switch

J. & H. Walter, Ltd., Farm Lane, London, S.W.6 **(Stand 75).**—The Walter "Nocord" iron and board are demonstrated.

Westinghouse Brake & Signal Co., Ltd., 82, York Way, London, N.1 **(Stand 60).**—Static phase convertors solve the problem of operating three-phase industrial motors from single-phase supplies. The largest unit available has a rating of 4 kVA, but may be connected in parallel to obtain any desired output. A feature of the latest hand-barrow charger is the recessed panel to protect the meter and other components against accidental mechanical damage. The "Stabilistor" a.c. voltage stabiliser is on view, together with the "Westat" rectifier equipment, which is compensated for both mains and load variations. Rectifier sets are also displayed.

Henry Wiggin & Co., Ltd., Wiggin Street, Birmingham, 16 **(Stand 67).**—Uses of Wiggin alloys in power generation, electric heating and industrial uses are demonstrated. Materials produced by the company include "Monel" metal, "Inconel," "Nimonic," "Brightray," "Ferry," "Thermometal," "JEA Metal" and pure nickel.

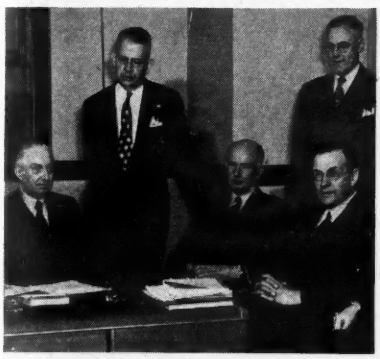
Wilkins & Mitchell, Ltd., Darlaston **(Stand 63).**—The model LK "Servis" washer has a number of safety features.

J. W. Woolley & Co., Ltd., Two Gates, Tamworth **(Stand 20).**—The heat storage steam generating section of an "Electrobloc" steam raiser is accompanied by the new spares kit for steam raisers and "Whizzer" sterilizers. Wall charts emphasize the night-load possibilities of the "Electrobloc" and the big part it can play in getting adequate revenue from a rural electrification scheme.

PERSONAL and SOCIAL

News of Men and Women of the Industry

IN the course of their tour of the United States and Canada the party of British Electricity Authority representatives who were studying power supply practice in North America visited the International General Electric Co , Inc., at Schenectady, New York. The company has sent us a photograph (which we reproduce) taken on the occasion when the delegates had consultations with the I.G.E. turbine engineering experts. A dinner in their honour was given by the company on 27th May.



B.E.A. officials at the I.G.E., Schenectady
Left to right: Mr. F. Shakeshaft (generation design engineer, B.E.A.), Mr. R. W. Finch (manager, I.G.E. apparatus sales, Schenectady), Mr. W. B. Noddings (deputy commercial manager, B.E.A.), Mr. P. J. Garey (assistant secy., I.G.E.) and (in front of him) Sir John Hacking (deputy chairman (operations) B.E.A.).

The party is returning to England by the *Queen Mary* which is due at Southampton to-morrow (Saturday).

A one-day summer meeting is being arranged by the South-Western Sub-Centre of the **Institution of Electrical Engineers** on 25th June at Two Bridges Hotel, Dartmoor. Following lunch, there will be a tour of the moor by motor coach, and there will be fishing, riding and organized events.

The annual dinner of the **Cromptonian Association** was held at the Café Royal, Regent Street, London, on 27th May, 250 members and guests attending. The toast of "The Association" was proposed by Sir Gilmour Jenkins, Permanent Secretary to the Ministry of Transport, and the Earl of Mount Edgcumbe, president of the Association, replied. Mr. S. W. Melsom proposed the toast of "The Guests," and recalled his early association with Colonel Crompton giving some interesting facts about the use of the first field telephone, which was credited to Colonel Crompton during the Boer War. Dr. H. J. Gough, President of the Institution of Mechanical Engineers, replied on behalf of the guests. Lt.-Col. C. Hardie proposed the toast of "The Company" and Mr. J. Harwood Fryer, joint managing director, Crompton Parkinson, Ltd., responded.

Belling & Lee, Ltd., held their annual visitors' day on 28th May, when the whole establishment was open to employees and their friends. The attendance numbered just over 1,000 and the day closed with the presentation of apprentices' awards, the finals of the table tennis championships and dancing.

Mr. A. H. Sutton, who joined the London office of the Edison Swan Electric Co., Ltd., in 1925 and became manager of the Liverpool sub-store, has been appointed manager of the Manchester Branch following the death of Mr. J. W. Garsden. **Mr. G. W. Nattrass** has been appointed manager of the Newcastle branch. He joined the company in 1930 and was transferred to Newcastle in 1933. He succeeds **Mr. W. Fitzgerald,** manager of the Newcastle branch for the last eighteen years, who has retired owing to ill-health. Mr. Fitzgerald has served the companies in the A.E.I. group for thirty-six years.

Mr. S. Boys, D.S.O., manager of the Bristol branch of the Edison Swan Electric Co., Ltd., since 1932, has retired on account of ill-health. He has been associated with the company since 1913 and after service in the 1914-18 war, was manager of the Sheffield branch from 1919 to 1932. He will continue to act in a consultative capacity at the company's Bristol office.

Mr. A. J. E. Hoyten

The company has appointed **Mr. A. J. E. Hoyten** to succeed Mr. Boys as manager of its Bristol branch as from 1st June. From 1929 to 1940 Mr. Hoyten represented the radio interests of the company in the Southern areas. After service in the R.E.M.E. he rejoined the Ediswan organization to take charge of maintenance sales with the Radio Division at head office.

Lt.-Col. Sir Alan H. L. Mount, C.B., C.B.E., R.E. (retd.), chief inspecting

officer of railways, is retiring from the Ministry of Transport on 31st July, after nearly thirty years' service in the Department, the last twenty of them in his present post. The Minister of Transport has appointed **Lt.-Col. G. R. S. Wilson,** R.E. (retd.), to succeed Sir Alan Mount. Col. Wilson has for the last fourteen years been a member of the railway inspection staff of the Ministry.

Mr. Ian M. Cameron has been appointed deputy manager of the Leeds branch of the Tube Investments subsidiary, Simplex Electric Co., Ltd.

Mr. I. M. Cameron

Mr. Cameron received his early training on the sales staff of the Wakefield Electricity Department, and joined the Simplex Electric Co., Ltd., in 1934. In 1938 he went to the Domestic Appliance Department of the English Electric Co., and in 1945 became sales and development manager of the Appliance Division of Clifton Aircraft, Ltd., being appointed to the board as sales director in December, 1948. He has relinquished this position on re-joining Simplex.

Mr. P. B. H. Cuff has resigned from the position of purchasing manager at the New Southgate factory of Standard Telephones & Cables, Ltd., to take up another appointment. He has been succeeded by **Mr. W. C. Bennett.**

Mr. J. R. Henderson, M.B.E., B.Sc., has joined the Croydon Engineering Co., Ltd., as chief engineer and works manager. He took over his new duties on 1st June and has relinquished his appointment with Weldall & Assembly, Ltd., Birmingham.

Mr. A. G. Honey, late of J. Stone & Co., has joined Browning's Electric Co., Ltd., as sales manager.

Mr. R. C. Hawkins, A.M.I.E.E., who has been a member of the staff of the British Electrical Development Association since 1927, and has also been assistant secretary of the Electric Vehicle Association for the past four years, has resigned to become "mine host" of the Oak House Hotel, Haselbury Plucknett, near Crewkerne, Somerset. Mr. Hawkins received his technical education at Finsbury Technical College, after which he was employed at the Cosmos Lamp Works, Brimsdown, Enfield. In 1924 he joined the staff of the E.L.M.A. Lighting Service Bureau, where his work brought him into close contact with E.D.A. Two years afterwards Mr. Hawkins opened a Lighting Service Bureau in Manchester, which was operated jointly by E.L.M.A. and E.D.A., and about a year later he became E.D.A.'s first area officer for the North-West of England, with headquarters in Manchester. During the war Mr. Hawkins served in the R.A.F., attaining the rank of squadron leader in the technical branch. On returning from the R.A.F., he was appointed to the E.D.A. headquarters staff, and was placed in charge of the work in connection with electric vehicles.

A pleasant ceremony took place on 31st May at the Great Northern Hotel, Dewsbury, on the occasion of the retirement of **Mr. P. S. O. Watson,** assistant superintendent at Thornhill power station, when presentations of a gold wristlet watch and a cheque were made to him on behalf of the staff.

Mr. P. W. Castle has been elected chairman of the London Students' Section of the Institution of Electrical Engineers for the 1949-50 session, and **Mr. I. J. Shelley** has been elected vice-chairman.

Mr. Castle served his apprenticeship with the British Thomson-Houston Co., Ltd., and subsequently held posts with the Birmingham Electricity Department, the Northmet Power Co. and the London Power Co. He is at present a member of the Technical Department of the London Division of the B.E.A. Mr. Shelley is with the British Broadcasting Corporation.

A presentation of a traveller's case and brief case has been made by the staff, employees and members of South Shields Corporation Transport Department to **Mr. H. J. Troughton,** transport manager at South Shields for twelve years who has been appointed a valuer with the Road Transport Executive.

A golf competition for the G. P. Dennis Trophy in aid of the **I.E.E. Benevolent Fund** will be open to all delegates to the National Electrical Power Convention at Torquay next week. It will be held at the Torquay Golf Club and can be played any time between to-morrow (Saturday) afternoon and 5 p.m. on Thursday. Players may take out as many cards as they wish during the time of the competition, on paying the entry fee for each card.

After twenty-five years' service, of which the last thirteen years have been spent as head of the Overseas and Engineering Information Department, **Mr. L. W. Hayes,** O.B.E., M.I.E.E., F.I.R.E., has resigned from the British Broadcasting Corporation to take up the post of vice-director of the Comité Consultatif International des Radiocommunications, in Geneva, in which he will be chiefly concerned with its activities in the broadcasting and allied fields. Consequent upon Mr. Hayes' resignation the following changes in the Engineering Divi-

sion of the Corporation have been made: The Overseas and Engineering Information Department, the Engineering Secretariat and the Engineering Training Department, have been formed into the Engineering Services Group. **Mr. F. C. McLean,** M.B.E., B.Sc., M.I.E.E., S.M.I.R.E., and Mr. **E. L. E. Pawley,** M.Sc., M.I.E.E., have been appointed head and assistant head respectively of this Group. **Mr. H. Wilkinson,** B.Sc., becomes head of the Overseas and Engineering Information Department, and **Mr. F. Williams,** B.Sc., M.I.E.E., head of the Engineering Secretariat. **Dr. K. R. Sturley,** M.I.E.E., continues as head of the Engineering Training Department.

Mr. H. Friedland, charge engineer at the Close power station, Newcastle-on-Tyne, retired on the 5th June after forty-five years' service. Mr. Friedland served his apprenticeship with C. A. Parsons & Co., at their Heaton works and was then employed by the Newcastle and District Electric Supply Co., until the nationalization of the industry.

Obituary

Dr. N. R. Campbell.—The death occurred at Nottingham on 18th May at the age of sixty-nine of Dr. Norman Robert Campbell. He was educated at Eton and Trinity College, Cambridge, and became a Fellow of Trinity College in 1904. He subsequently took up a Cavendish Research Fellowship at Leeds University. Dr. Campbell joined the staff of the National Physical Laboratory soon after the outbreak of the 1914-18 war and worked there in association with the late Sir Clifford Paterson. In 1919 he joined the staff of the G.E.C. Research Laboratories which were then being organized under Paterson's leadership. He retired, after ten years of ill-health, in 1944. In his university career Dr. Campbell studied the ionisation of gases and (with Mr. A. Wood) established the radio-activity of potassium. At the N.P.L. he investigated the mechanism of the discharge in spark plugs. His early work with the General Electric Co., Ltd., concerned the clean-up of gases in the electric discharge. He also worked on photoelectricity, photoelectric photometry and colour matching, statistical problems and (with Francis and James) the theory of "noise" in thermionic valves and circuits.

Mr. David Macfarlane Macleod, M.I.E.E., who was chief engineer of the Clyde Valley Electrical Power Co. from 1905 until he retired in 1933, died on 29th May at his home in Cambuslang. Mr. Macleod served an apprenticeship in Govan and was later with the Edinburgh and Aberdeen Corporations and in London before his appointment as chief engineer of the Clyde Valley Co. He was a past chairman of the Scottish Centre of the Institution of Electrical Engineers. He was seventy-three.

Mr. R. Newing.—The death occurred suddenly on 26th May at the age of forty-four of Mr. Robert Newing, M.I.E.E., who for twenty-eight years was with the Associated Portland Cement Co. as an electrical engineer, Works Department. The funeral took place at Christ Church, Gravesend, on 30th May.

Mr. J. T. Jones.—The death occurred suddenly on 24th May, of Mr. J. Trevor Jones, district commercial manager of District 342, South Wales Electricity Board. Mr. Jones was educated at Bangor and was, until 1929, mains engineer with the Manchester Corporation. In that year, he became electrical engineer and manager to the Gellygaer U.D.C. Electricity Department, a position he held until vesting date.

Mr. F. Proudfoot.—The death occurred on 22nd May at the age of fifty-five of Mr. Frederick Proudfoot, M.C., second assistant system operation engineer, South-West Scotland Division of the British Electricity Authority. Mr. Proudfoot spent the whole of his life in the electricity supply industry, and was one of the first control engineers employed on the national grid system. He served throughout the 1914-18 war, attaining the rank of captain in the Black Watch, and was awarded the Military Cross and Bar.

Mr. James Macdonald, for many years chief electrical engineer to Glasgow Corporation Transport Department, died on 1st June. He become chief electrical engineer in the Glasgow Transport Department in 1925, and later went to South Africa to join the Cape Town Tramways Co. He retired in 1946.

Mr. S. D. Firth.—The death occurred suddenly on 4th June of Mr. Samuel Dearden Firth, chairman of F. C. Blackwell & Co., Ltd., of Liverpool.

Wills

Mr. H. W. Rowell, founder of Ellison Insulations, Ltd. (now Tufnol, Ltd.) left £4,869 gross (£4,781 net).

Col. W. A. Bristow, a pioneer in aviation, low temperature carbonization and extraction of oils and chemicals from coal, and also chairman of Rashleigh, Phipps & Co., Ltd., left £21,054 gross (£11,474 net).

Mr. R. O. Willmott, electrical manufacturer, Muswell Hill, left £7,240 gross (£7,160 net).

Mr. F. H. Boyden, electrical engineer, Wanstead, left £3,691 gross (£3,635 net).

Mr. R. F. White, A.M.I.E.E., left estate "so far as can at present be ascertained" valued at £144,071 gross (£134,975 net).

Wandsworth Street Lighting

GARRATT LANE, Wandsworth, is a busy road carrying traffic between Wandsworth and Tooting. At the Henry Price Estate where the road curves in a double bend the Wandsworth Borough Council has made a trial installation of the Metrovick "S.O. Fifty" lantern. These

Metrovick lighting in Garratt Lane, Wandsworth

totally enclosed refractor lanterns are moulded from "Perspex" acrylic sheet. The lanterns, each of which houses a 140 W sodium discharge lamp, are mounted at 25ft on existing trolley-bus poles and the resultant lighting effect on the 30-40ft wide road is shown in the accompanying picture.

Board and Exhibitions

SPEAKING at a lunch at the Bath and West Show, Mr. S. F. Steward, C.B.E., chairman, South Western Electricity Board, paid a tribute to the British Electrical Development Association for its work in the organization of exhibitions. He said that that work must be continued but the integration of the previous undertakings in the Electricity Board has necessitated the reconstruction of the Area Committee and the review of its functions. The South Western Board, in organizing shows and promoting interest in electricity, would have continuing need of the advice and specialist facilities of E.D.A., but they as a Board must take full responsibility for such matters, using the services of E.D.A. to reinforce their own.

The Board was setting up a new Development Committee, which would be able to maintain and strengthen the links with E.D.A., and also to work in conjunction with other electrical interests in the area, such as the Electrical Contractors' Association, who were equally keen to stimulate the use and application of electricity.

Reyrolle Inquiry

Mr. G. Wansbrough Resigns

IN December last, on a motion by Equatorial Trust, Ltd., a shareholder, Mr. Justice Vaisey made an order for an investigation of the affairs of A. Reyrolle & Co., Ltd., by a Board of Trade Inspector. Counsel for the company said that serious allegations had been made to which there was a good reply but the company felt that the whole matter should be thrashed out before an inspector. The company therefore consented to the order For the Equatorial Trust, Ltd., it was stated that the Trust was not seeking an inquiry because anything wrong had been done by the company. The complaint was on the ground of alleged misfeasance by a director.

The case was followed by the announcement that the chairman of Reyrolles, Mr. George Wansbrough, was resigning the position (which he had held since 1945) but continuing as a director. On Tuesday last the company stated that Mr. Wansbrough had resigned from the board.

The inquiry, which is being conducted by Sir Douglas Garratt, is not yet complete although it is stated by the Board of Trade that a draft report has been prepared.

Diesel-Electric Express

BRITAIN'S first main line diesel-electric locomotive, the 3,200 h.p. twin unit, constructional features of which were described in the *Electrical Review* of 26th December, 1947 (page 957), left Euston Station on Wednesday of last week with the 10 a.m. Royal Scot express for Glasgow. It hauled a 16-coach 506-ton train and maintained a minimum speed of 33 m.p.h. up Shap Fell and 32.25 m.p.h. up the ten-mile climb to Beattock summit, where 5.5 minutes were clipped off the schedule of 22 minutes. The train arrived in Glasgow at 6.25 p.m., thus covering 401.25 miles in 8 hours 25 minutes according to timetable. The journey was undertaken to prove the unit's capacity for sustained running and afforded the manufacturers an opportunity for a full-scale trial under main line traffic conditions.

Higher Wattage Lamps.—Manchester Corporation proposes to substitute 500 W lamps for those of 300 W on the main roads in the city area, and 200 W for 100 W lamps on all subsidiary routes.

Pakistan Water Power

PLANS FOR DEVELOPMENT

IN an article written by the United Kingdom Senior Trade Commissioner in Pakistan for the *Board of Trade Journal* it is stated that despite large potential supplies of hydro-electric power, Pakistan is at present ill-equipped in this direction. Coal deposits in Pakistan are limited and consist almost entirely of inferior qualities, whilst supplies from India, upon which she depends almost entirely, are below full requirements, and oil in adequate quantity has yet to be found. Industrial expansion must, therefore, depend on the tapping of Pakistan's extensive supplies of water power, lying almost entirely in the North-West Frontier Province. The Pakistan authorities are alive to the necessity of rapid development.

A number of schemes have been put in hand during the past year, involving a total expenditure of about £11¼ million. It is hoped that the Malakand hydro-electric station which at present has an installed capacity of 10,000 kW, will be doubled by early 1950, and tenders are now being considered for a duplicate station to be erected at Darghai, using the same waters and producing approximately the same power, whilst the transmission lines to carry this power to the West Punjab are already completed. Work is also in hand on the Karnafuli scheme in East Bengal, which will produce 40,000 kW, and a decision has also been taken to construct a dam at Warsak on the Kabul river to provide irrigation and to generate hydro-electric power up to 140,000 kW.

Preliminary work is also in progress on the Jungshai scheme on the Indus, which should have a capacity, at the height of the season, of 10,000 kW.

These schemes will inevitably take some time to complete, but will represent a very considerable increase in the power resources of Pakistan from the present 65,000 kW in Western Pakistan and 6,000 kW in Eastern Pakistan. From the United Kingdom exporters' point of view they will mean a very considerable demand for electrical machinery and for contractors' plant and machinery generally; possibly also an opening for the services of constructional engineers—whilst the electrical power provided by the completed installations should result in a demand for electrical apparatus and machinery on an important scale. Meanwhile Pakistan is endeavouring to make up the deficiencies in her power supply by the installation of a number of thermal plants and the purchase of diesel engine generating sets, for which a number of invitations to tender have been issued.

Research Reports

NEW E.R.A. PUBLICATIONS

WE have just received five of the most recent technical reports of the British Electrical and Allied Industries Research Association. The first of these (Ref. G/T212), by A. Kobler, B.Sc. (6s), records the results of a preliminary examination of the circumstances in, and mechanism through, which carbon might be deposited on insulator surfaces in switch oil in quantity and condition conducive to breakdown over such surfaces. The work aims at the development of methods of obviating or minimizing the possibility of occurrence of these conditions.

The second report (Ref. L/T193), by S. Whitehead, M.A., Ph.D., M.I.E.E. (director of E.R.A.) (9s), deals with the breakdown of solid dielectrics, which frequently begins by the appearance of inclusions or paths either of low electric strength or of relatively high permanent conductivity. It has frequently been suggested that thermal instability can occur in the dielectric in the neighbourhood of these defects. This instability, it has been supposed, will enlarge the defect which may thus propagate itself, or the dielectric will rise in temperature until a breakdown path is formed. The object of the report is to examine some aspects of this hypothesis.

In report Ref. L/T197, by R. A. Sack (6s), the previous theory of flow applicable to bitumens of the sol type is extended to calculations of the variation of the effective viscosity under tensile and compressive stresses. It is found that for steady flow the viscosity should increase under tension and decrease under compression. In practice the viscosity decreases with applied stresses irrespective of sign and a number of suggestions are made to account for this discrepancy. Experiments are suggested to determine any difference between the effective viscosities for equal tensile and compressive stresses; the magnitude of this difference would indicate to what extent the elastic properties of bitumens are due to their solid and fluid components respectively.

The dielectric properties of liquid

silicones are examined over a wide range of temperature and frequency in a report (Ref. L/T201) by E. Rushton (6s). There are marked differences in dielectric properties between the low- and high-viscosity liquids. All of those examined exhibited excellent dielectric properties up to 100 Mc/s, but the high-viscosity ones have power factors of the order of 0.01 at 3,000 Mc/s. The silicones are polar materials, but they do not conform to the simple Debye model for liquids of relatively low viscosity where the relaxation time is directly proportional to the viscosity at chain length. The relaxation times, after increasing at first with chain length, tend toward a constant value for long chains.

The energy dissipated by discharges in voids of the dielectric of a capacitor connected to an a.c. supply is discussed in a report (Ref. L/T207) by H. Pelzer, Dr.Phil. (3s). Some time ago Austen and Hackett pointed out that this could be calculated in two ways. Either the sum is taken of the energies dissipated in single discharges, or the sum of the energies taken out of the supply at the single discharges. The latter sum consists of positive and negative contributions because energy can be stored and given back to the supply at a later discharge, while the former sum can obviously consist of positive contributions only. Taken over a sufficient number of cycles, however, both sums yield the same result. As one or two notes have appeared during the last year which seem to make use of a mistaken expression for the total dissipated energy, the expressions are reproduced and an idealized example is given as illustration.

These publications are available from the Association at Thorncroft Manor, Dorking Road, Leatherhead, Surrey, at the prices stated (postage 3d extra in each case).

Readership in Telecommunications

FOLLOWING discussions between Standard Telephones & Cables, Ltd., and Professor Willis Jackson, concerning the need for a fuller development of facilities for post-graduate teaching and research in the field of telecommunications, the company has endowed a "Henry Mark Pease Readership in Telecommunications" in the City and Guilds College of the Imperial College of Science and Technology, South Kensington.

Henry Mark Pease, one of the pioneers of the telephone industry in this country, who died in 1947, was managing director of Standard Telephones and Cables until 1928. He took an active part in forming the British Broadcasting Company, and was one of its original directors.

Mr. E. C. Cherry, M.Sc., A.M.I.E.E., has been appointed to the Readership. Mr. Cherry was attached to the Telecommunication Research Establishment of the Ministry of Aircraft Production during the war period and is known particularly for his contributions to the subject of electric circuit analysis.

Claim Against Scottish Board

LORD SORN gave judgment on 31st May in the Court of Session allowing proof in the action in which Mr. James Paterson sued the South-West Scotland Electricity Board for the payment of £54,827. It was stated that in 1939 the claimant, who was then 50 years of age, and partner in a Glasgow law firm, became general manager of the Clyde Valley Electrical Power Co. He had a 15-year contract under which he was to be paid a salary of not less than £4,500 per annum and was to be admitted to benefit under the superannuation fund. In consequence of the Electricity Act of 1947 the company was nationalized and all its property, rights, and obligations were transferred to the Electricity Board on 1st April, 1948.

At the date of the transfer Mr. Paterson was receiving a salary of £6,000 per annum and, had matters been allowed to run their course, he would have been entitled to retire at the expiry of the contract (in another 5¾ years) with a pension of £3,000 for life. The Board, however, terminated the contract as from 1st April, 1948, and Mr. Paterson claimed as liquidated damages the actuarial value of the salary and pension to which he would have been entitled.

The Board resisted the claim on the ground that the contract provided, not for liquidated damages, but for a penalty, and that it was therefore unenforceable.

Lord Sorn said the case could not be disposed of finally at this stage because the Board did not admit the accuracy of the sum into which Mr. Paterson had translated his claim and, if he was in his favour, there must be proof of the computation. If he was against him, it was not disputed that he was entitled to go to proof on damages in the ordinary way. In the surrounding circumstances his Lordship thought it was certainly conceivable that the parties contemplated the possibility of the damage to Mr. Paterson being aggravated by inability to obtain other employment. His conclusion was that the pre-estimate, though generous, was not unconscionable and the company, or its successors, must therefore fulfil the obligation which it undertook.

I.E.E. in Scotland

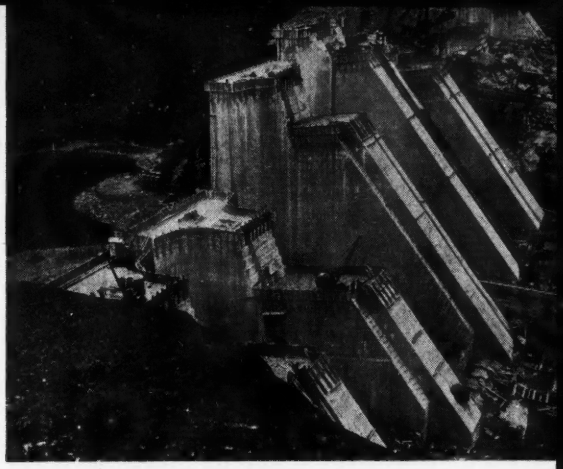
TOUR OF WORKS AND WATER-POWER PROJECTS

THE first post-war summer meeting to be organized by the Institution of Electrical Engineers took place last week in the area of the Scottish Centre, which is the fourth largest of the ten Centres, with a membership of 1,443 that has increased by more than 100 annually for the past few years. A party of 330 members, with their ladies, assembled in Edinburgh on the Monday and were given a civic reception in the evening at the Assembly Rooms.

On the Tuesday morning there was a sightseeing excursion by coach for the ladies and a choice of three visits to works. At the Portobello power station (South-East Scotland Division, 116,500 kW) preparations are being made for the installation of some of the largest pulverized fuel-fired boilers in the British Empire. The drums have been erected for the first boiler and the installation of tubing has commenced. They are of the radiant "Lopulco" type made by International Combustion, Ltd., having a plain tube-lined combustion chamber tangentially fired with three tilting burners in each corner. The rating is 540,000 lb/hr (m.c.r.) at 1,400 lb/sq in and 960 deg F. Coal consumption is at the rate of 25 tons/hr; pulverization is by roll mills. Electrostatic flue gas precipitators are being installed.

The high-pressure turbo-alternator being built by Richardsons, Westgarth & Co., Ltd. (see *Electrical Review*, 27th May), is a three-cylinder cross-compound set driving twin 30 MW alternators.

The East Pilton works of Bruce Peebles & Co., Ltd., are on the north side of Edinburgh. Several important contributions to rotary machine design have been made there and major contracts are being carried out for water power plant in Scotland.



View of the Loch Sloy dam (May, 1949)

The Crewe Toll works of Ferranti, Ltd., which were completed in 1943, are concerned with the development of radar and aircraft equipment, vacuum physics and special valve circuits.

After luncheon as the guests of Bruce Peebles & Co. the whole party travelled by road on Tuesday afternoon (stopping for tea at Crieff Hydro by invitation of Ferranti, Ltd.) northward to Pitlochry for an excursion on the Wednesday to development sites of the North of Scotland Hydro-Electric Board.

Tummel-Garry Project

The Tummel-Garry scheme in Perthshire was started by the Grampian Electricity Supply Co. whose water-power stations at Rannoch and Tummel Bridge commenced operation in 1930 and 1933 respectively.

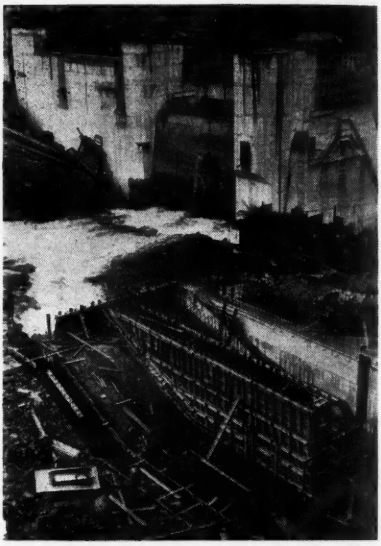
The present constructional work being undertaken by the Board is centred in the basin of the River Tummel, will have an annual output of about 300 million kWh and is a logical development in that the same water (with additions) will be re-used in the Clunie and Pitlochry stations, involving the construction of three dams, three power stations and the driving of tunnels with aqueducts for a total distance of more than 20 miles.

The highest reservoir will be on the upper reaches of the River Errochty, a tributary of the Garry, where a mass concrete dam will form a new loch three miles long with a top-water level nearly

1,100 feet above sea level. To augment the catchment area an aqueduct and tunnel will collect water from the upper reaches of the Rivers Bruar and Garry into the new loch; thence another tunnel five miles long will convey the water to the Errochty power station near the western end of Loch Tummel.

At the eastern end of Loch Tummel, the Clunie dam will raise the level of the loch about 17 feet and more than double its length.

The river is now being by-passed through the left-hand part of the dam and the coffer dam has been swung across to permit excavation of the other half of the site. The station steelwork and roof have been erected and plant is now being installed.

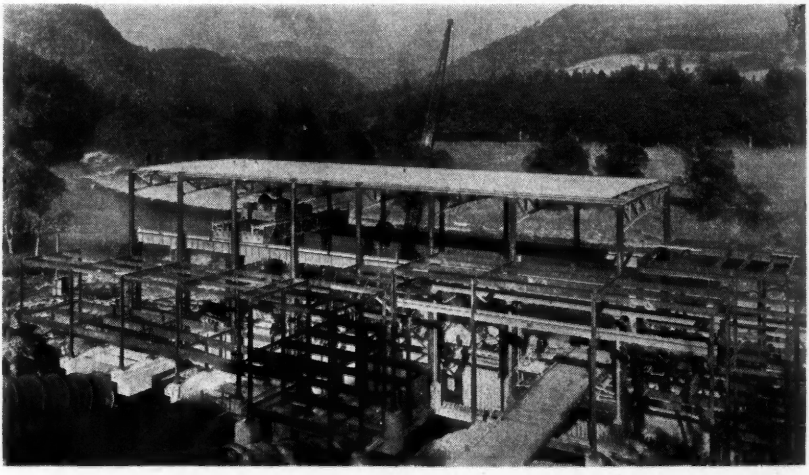


Clunie dam, five miles above Pitlochry, with tunnel entrance in foreground and foundations for three pierheads to carry road over front of tunnel, May, 1949

About 50 yards upstream from the dam the inlet of the two-mile tunnel, which will lead the water to Clunie power station, is being driven. It will be concrete lined, of horseshoe section with an equivalent diameter of 23 feet and it will have the largest cross-sectional area of any water tunnel in Great Britain.

Clunie power station, near the junction of the Rivers Tummel and Garry, will discharge water into another new winding loch to be formed by the dam at Pitlochry with a control tower 74 feet above the surface to equalize the discharge from

View of Clunie power station, looking north, October 1948



the Clunie power station. Incorporated in the dam will be the Pitlochry generating station, which will return water to 40 miles from Glasgow. Before work could commence, the Board had to build access roads of over 17 miles, a railway

TABLE I—PRINCIPAL TECHNICAL PARTICULARS

Project	Errochty	Clunie	Pitlochry	Lawers	Sloy
Dam length, ft	1,310	386	475	1,250	1,160
Dam height, ft	127	65	54	130	165
Catchment, sq miles	86	515	706	17.5	32
Yearly rainfall, in	55	60	55	87	115–120
Gross head, ft	610	173	50	1,362	910
Plant, kW	3–25,000	3–19,000	2–7,500	1–30,000	4–32,500
Type	vertical Francis	vertical Francis	Kaplan	horizontal Pelton	vertical Francis
Annual output, million kWh	103	143	54	71	130
Storage, per cent	15.5	27.5	22	17	16.7

the River Tummel. The station steelwork is being erected and the shifting of the coffer dam to dry out the left half of the site has started.

Lawers Project

The Lawers project (still in process of approval by Parliament) will have the highest head so far of any of the Board's projects. Lochan na Lairige, 1,620 feet above sea level on the high pass between Loch Tay and Glen Lyon, in Perthshire, will have its level raised to 1,710 feet above sea level. (See *Electrical Review*, 27th May, 1949.)

The station will be at Finlarig, at the Killin end of Loch Tay. For the purpose of manning and control, it will form one of a group of five unattended stations to be remotely controlled from a centre near Killin, the group having an annual output of 370 million kWh and a plant capacity of 120,000 kW.

Part view of water turbine foundations in Pitlochry station, May 1949

Loch Sloy Project

The Sloy site, a small loch with a maximum depth of only 20 feet in the hills above Loch Lomond, is less than 40 miles from Glasgow. Before work could commence, the Board had to build access roads of over 17 miles, a railway siding and camps for about 2,000 men.

The principal parts of the scheme are a dam across the lower end of Loch Sloy, a tunnel 1¾ miles long through the 3,000-ft high Ben Vorlich, and pipelines from the two outlets of the tunnel to a station of 130,450 kW on the shore of Loch Lomond. Other works include a subsidiary tunnel about a mile long to divert waters from Allt Ardvorlich outlying collecting aqueducts, a road bridge over the tail race of the station and the opening of a quarry to supply aggregate for the concrete.

The dam, which in places has now risen 80ft above the level of the loch, is of a

massive buttress type. Crushed rock from the quarry is delivered to the site by an electrically driven conveyor belt 1⅛ miles long, capable of handling 1,500 tons daily. Sand is brought in barges from a pit opened at Balloch at the southern end of Loch Lomond; it is landed at Inveruglas Bay and conveyed by lorry to the various sites. To assist the laying of concrete, twin electrically driven aerial cableways with a span of 1,350ft and headmasts 120ft high were erected above the dam site. Each can carry 10 tons at travelling speeds up to 1,000 ft/m and can hoist this load 190ft above the bottom of the dam.

To lead the water from the dam to the generating station, a tunnel, horseshoe in shape, has been driven through Ben Vorlich, completed on 12th April, but still to be finished internally. Its final diameter will be 15ft 4in, except at the lower end where it divides into two branches, each with a finished diameter of 10ft and about 500ft in length. The main tunnel has been driven from four faces, one at each end and two worked from an intermediate adit.

Near the lower end of the tunnel is a surge shaft and the twin outlets of the main tunnel are 642ft above the generating station. The water will leave these tunnels through two short 10ft diameter pipes which branch into four 7ft diameter pipes. Below the valve house four lines of sloping steel pipes of 6ft 7in diameter will convey it to the generators. Altogether 6,270ft of steel piping is involved and the static head will be 910ft, creating a pressure of nearly 400 lb/sq in.

The generating station at Inveruglas is a steel framed building with a frontage of 260ft; it is built of concrete and will be faced with prefabricated granite slabs. In addition to the main Francis turbo-alternators there will be a 450 kW Pelton set for auxiliary and local supplies.

Other Works Visits

Proceeding by road on the Thursday by Loch Tayside the party passed the site of the 30,000 kW generating station of the Lawers project at the west end of Loch Tay by Killin Pier, halting there for refreshment provided by the J. L. Eve Construction Co., Ltd. Continuing along the route of the 132 kV Tummel-Sloy transmission line, Arrachar and Tarbet were reached in time for luncheon at the invitation of the North of Scotland Hydro-electric Board.

After an excursion to the Loch Sloy project and enjoying tea served by the Board the visitors embarked at Tarbet pier for a steamer trip to the southern end of Loch Lomond, then going on by road to Glasgow.

On the Friday there was a choice of three whole-day and five part-day visits with luncheon and/or tea provided by each of the companies concerned. The return from the Alloa works of the Harland Engineering Co., Ltd., makers of large centrifugal pumps, electrical machinery and switchgear, was by way of Callander and the Lake of Monteith. The manufacture of pumps, valves and hydraulic fittings was seen at the Kilmarnock works of Glenfield & Kennedy, Ltd., while men only went to the Babcock & Wilcox works at Renfrew.

The Deanside works of Scottish Cables, Ltd., founded in 1937, have a floor area of 250,000 sq ft and occupy a 20 acre site on the south bank of the River Clyde at Renfrew. An alternative morning tour was of Lewis's Royal Polytechnic, Ltd., a multi-department store which has a considerable electrical installation.

Alternative afternoon visits were to the Glasgow carpet factory of James Templeton & Co., Ltd., and parts of the cotton thread mills at Paisley of J. & P. Coats, Ltd., while men only went on a tug trip down the River Clyde.

The week's tour terminated with a civic reception by the Lord Provost of Glasgow in the City Chambers.

Mushroom Growing

TO assist amateurs and small commercial growers to produce their own mushrooms successfully, Messrs. S. B. Jackson, 12, Rampayne Mews, London, S.W.1, have evolved a technique which is claimed to yield over 2½ lb of mushrooms per sq ft in a season. Special compost is used in conjunction with thermostatically controlled electric heating and a novel watering method which introduces moisture to the roots only. The total growing cycle is approximately seventeen weeks, enabling three crops per annum to be obtained. The capital cost for a 50 sq ft bed is £7 10s, while the operating cost per crop, inclusive of electricity, compost, spawn and incidentals is 1s 6d to 1s 9d per lb produced.

COMMERCE and INDUSTRY

Supply Industry Wages : New Cable Company

THE National Joint Industrial Council of the Electricity Supply Industry has reached agreement providing for an increase, within the maximum of 1½d per hour, in rates of pay for manual workers who are now in receipt of standard scheduled rates.

A variation in terms of conditions for shift workers in the electricity supply industry has also been negotiated, whereby the amount previously paid for shift work has been reduced and overtime payments for Sundays and Bank Holidays substituted.

India Buys American Plant

According to the *Electrical World*, one of India's largest post-war orders for electrical equipment has been placed with the International General Electric Co. The apparatus will be installed at the Damodar Valley Corporation's projected $25 million Bokaro steam power station, 200 miles west of Calcutta. Included in the order are three 50,000 kW turbo-generator sets, three large power transformers, switchgear, motors and other equipment, together with engineering services.

The Westinghouse Electric Co. has also entered into an agreement with the Government of the East Punjab Province for the design and equipment of a 110,000 kVA hydro-electric scheme on the Sutlej River. The equipment will cost approximately $9 million. Two major water-wheel turbo-generator installations are being provided, designated Nangal I and Nangal II, six miles apart. Each will have two 33,500 h.p. turbines and two 27,500 kVA 11 kV 50 cycle generators. Equipment will take approximately three years to manufacture, with Nangal I apparatus scheduled for shipment in two years.

S.W. Scotland Service Centres

The South West Scotland Electricity Board has established another service centre. This is at Irvine (Ayrshire Sub-Area), and was opened recently by Provost Green of the Burgh of Irvine. Two further service centres in the Board's area are now nearing completion, and will be opened at an early date.

Company's Profit-sharing Scheme

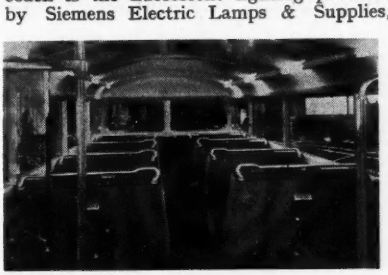
The thirty-fifth annual meeting and profit sharing of the directors and employees of Horace Green & Co., Ltd., was held in the works canteen on 25th May. Mr. Horace Green, in a review of the year's working, reported a record output. He declared a dividend on the wages earned throughout the year, stating that this was an increase over last year. The average over the last thirty-five years was about 10 per cent. Mr. G. S. Green also gave a brief address. A vote of thanks to the directors was proposed by Mr. I. Wright, one of the oldest employees, and Mr. A. Green and Mr. G. W. Green responded.

Occupational Dermatitis

Much productive labour is lost through industrial dermatitis, and in order to assist medical officers and those who are responsible for the health and welfare of the industrial worker, Innoxa Laboratories, Balls Pond Road, London, N.1, has published a booklet on the causes and control of occupational dermatitis, in which barrier creams as a preventive are recommended.

Double-Deck Coach Lighting

In our issue of 12th February we described an experimental double-deck coach which London Transport had produced for use on Green Line routes. A feature of this coach is the fluorescent lighting provided by Siemens Electric Lamps & Supplies, Ltd., to designs prepared by the C.A.V. Co. There are eighteen fittings for interior illumination, nine in the upper saloon, eight in the lower saloon and one on the platform. The accompanying illustration shows the lighting of the upper deck.



"Sleray" fluorescent lamps in the new Green Line double-deck coach

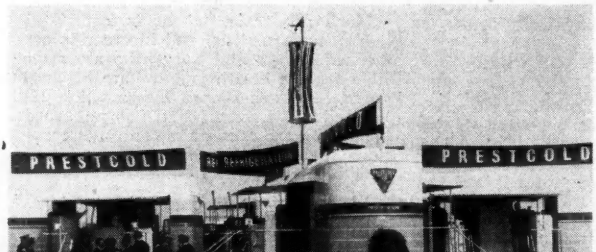
Aluminium Wire and Cable

The Aluminium Wire & Cable Co., Ltd., has been formed by the British Aluminium Co., Ltd., Tube Investments, Ltd., and the Hawker Siddeley Group, Ltd., to operate a modern works at Port Tennant, Swansea, to centralize technical and research facilities and to co-ordinate development work in

new materials and applications. The factory is engaged exclusively in the production of aluminium and aluminium-alloy rod, wire and overhead conductors. A brochure has been produced by the company (obtainable from the sales office, 10, Buckingham Place, Westminster, S.W.1) describing the range of "Awco" products and their properties with a number of good illustrations.

Refrigeration Mobile Exhibition

In our issue of 20th May we referred to the fleet of "Prestcold" mobile exhibitions which the Pressed Steel Co., Ltd., has



"Prestcold" mobile exhibition in service

launched and which will be shown all over the country at agricultural shows, industrial fairs, markets and public exhibitions. As will be seen from the accompanying picture, when opened out they form complete showrooms in which is displayed the full range of "Prestcold" refrigeration.

Greenhouse Thermostats

There was a reference in our issue of 6th May to greenhouse thermostats for 100 W heaters. We are informed by the Rheostatic Co., Ltd., that this "QG" type thermostat is, in fact, being used for the control of a.c. heating loads up to 15 A.

Resistance Materials

A 23-page technical brochure entitled "Electrical Resistance Materials," which has just been issued by Johnson, Matthey & Co., Ltd., 73-83, Hatton Garden, London, E.C.1, is a revised edition of Publication 1440. It describes the entire range of resistance alloys manufactured by the company, including nickel-chromium, copper-nickel and "Minalpha," as well as special materials for unusual applications. These materials are available as precision drawn fine wires, either bare or protected with one of a range of enamel or silk coverings. Fully detailed tables of the physical data relating to these products are included in the booklet, and are supplemented by equivalent tables in metric units.

South African Import Restrictions

The United Kingdom Acting Senior Trade Commissioner in South Africa reports that he has been officially informed that import licences for capital goods are to be issued on an *ad hoc* basis, according to the merit of each case and the degree of desirability of the industry concerned in the eyes of the Union authorities. Licences must, therefore, be applied for in the Union by the agents of the United Kingdom manufacturer.

Electronics Centre

Cinema-Television, Ltd., and Dawe Instruments, Ltd., have joined forces to provide at 83, Piccadilly, London, W.1, a centre at which visitors, besides seeing a very wide range of electronic apparatus, can exchange information and discuss their problems regarding the use of electronics in science and industry. Among the apparatus displayed are measuring instruments, atomic equipment, stroboscopes, industrial counters, oscilloscopes, communication equipment, metal detectors, photographic flash units, photo-electric cells and cathode ray tubes.

Changes of Name

B. & R. Meltrem Electrical Co., Ltd., has changed its name to Meltrem Electrical Co., Ltd. (originally B. & C. Electrical, Ltd.).

Carter Martineau, Ltd., have changed their name to Carter Industrials, Ltd.

Electric Vehicles for Postal Work

In the House of Commons last week Mr. F. J. Erroll asked the Postmaster General whether he would consider using electric battery vehicles for the collection and distribution of mails in urban areas.

Mr. Hobson, the Assistant Postmaster-General, replied that experience with various types of electric battery vehicles over many years had shown that this type of vehicle did not meet all the requirements

of Post Office transport services. For transporting mails in sorting offices, at stations, and between sorting offices and nearby stations, electric battery tractors and trucks had been in use for many years.

Distribution Costs

The International Chamber of Commerce Commission on Distribution, which was dormant during the war, was re-established in 1947 to conduct a large-scale inquiry into distribution questions with a view to making recommendations designed to reduce the general costs of distribution. The preliminary results, which will be reviewed at the twelfth biennial congress of the I.C.C. at Quebec from 13th to 17th June, have been published in the form of three brochures—No. 131, "Distribution Statistics Essential or Useful to Trade and Industry," No. 132, "Marketing Research Development, Methods and Applications," No. 133, "Trends in Business Training, an International Survey."

Copies of these brochures can be obtained from the British National Committee, International Chamber of Commerce, 14, Queen Anne's Gate, London, S.W.1.

E.D.A. Advertising Campaign

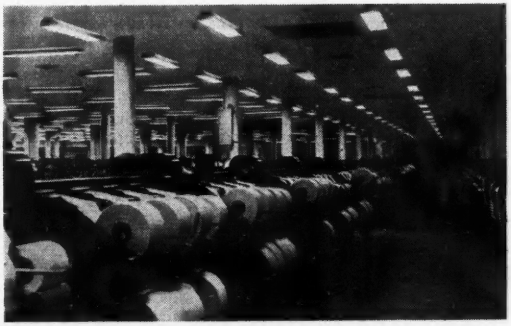
The British Electrical Development Association has launched an extensive publicity campaign in the national Press and magazines which will continue into 1950, and in this connection has revived its pre-war services of providing local advertising material to link up with the national publicity scheme. The Association has issued a booklet giving particulars of its campaign and of the material available for local advertising.

Street Lighting Control

On page 810 of our issue of 13th May we described a new automatic street lighting control device manufactured by Elliott Bros. (London), Ltd. We are informed that the development of this device was based on the use of "Megatron" selenium photocells of the barrier-layer type, made by Megatron, Ltd., 115a, Fonthill Road, London, N.4.

Hong Kong Mill Lighting

The new Wyler Textile Mills recently built at Kwa Wan, Kowloon, Hong Kong, are of very modern construction. The mills are air-conditioned and windowless; Metrovick fluorescent lighting is used throughout the day. A total of 960 5ft fluorescent trough reflectors have been installed and the value of the illumination in most departments is 25 lumens per sq ft. Since this factory was put into commission the Metropolitan-Vickers Electrical Co. has also provided fluorescent lighting for the Hong Kong Cotton Mills and Kowloon Textiles. Each installation uses about 1,000



Metrovick fluorescent lighting, Wyler Textile Mills, Hong Kong

Metrovick 5ft fluorescent lamps in trough reflectors.

Annual Holidays

The works of Bruce Peebles & Co., Ltd., will be closed for the Edinburgh trades holiday from the evening of 1st July to the morning of 11th July.

Trade Announcements

As part of considerable alterations and extensions to the Manchester factories of the **British Driver-Harris Co., Ltd.,** the hot mill is to undergo major modifications which will involve closing it for about two months, probably July and August. To overcome any dislocation in deliveries, the company has built up a large stock of rod in "Nichrome" and its other alloys. Customers who may require material not within the standard range have been asked to give notice well before the temporary shutdown.

William McGeoch & Co., Ltd., have appointed the following area representatives. North West area, including Manchester, Liverpool, North-West England and North Wales, Mr. T. Metcalfe, with headquarters at Manchester; South-West area, including Bristol, Bath and South Wales, Mr. W. D. James, with headquarters at Bristol; East Coast area, including Eastern Counties, Mr. R. Catchpole, with headquarters at Norwich. The company's Birmingham

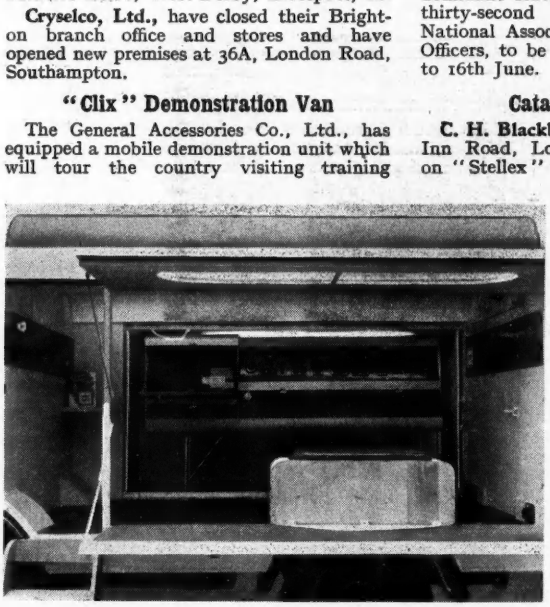
works will be closed for the annual holidays from 2nd to 10th July inclusive.

Mr. J. H. Grierson has been appointed technical representative to the **Power Centre Co., Ltd.**, in Lancashire, Cheshire and Yorkshire. For the time being he will operate from his private address, 267, Princess Drive, West Derby, Liverpool, 12.

Cryselco, Ltd., have closed their Brighton branch office and stores and have opened new premises at 36A, London Road, Southampton.

"Clix" Demonstration Van

The General Accessories Co., Ltd., has equipped a mobile demonstration unit which will tour the country visiting training schools and other organizations. Special invitations will be issued to Women's Institutes, Townwomen's Guilds, E.A.W. branches and youth organizations, and the van will also visit exhibitions. It will be at the British Electrical Power Convention at Torquay next week.



"Clix" demonstration van with one side removed, showing interior

The unit is equipped with showcases designed to demonstrate the method of construction and ease of installation of "Clix" accessories, and a 16 mm film strip projector shows interesting technical developments. Fluorescent lighting is installed. The van has been wired (by Troughton & Young, Ltd.) to take a 230 V a.c. supply direct from mains; where this is not available a 1 kW portable a.c. generator set is used.

Inquiries regarding the use of the unit should be addressed to the company's offices at Barton Hill Works, Bristol, 5. No charge is made and the van will be under the control of an engineer who will demonstrate and give lectures.

N.A.L.G.O. Annual Conference

Dissatisfaction with low salaries in local government and the national health, electricity, gas and transport services is the dominant feature of the agenda for the thirty-second annual conference of the National Association of Local Government Officers, to be held at Aberdeen from 14th to 16th June.

Catalogues and Lists

C. H. Blackburn & Co., Ltd., 10, Gray's Inn Road, London, W.C.1.—Two folders on "Stellex" electrically heated food conveyors and bowl and utensil sterilizers.

Common Ground, Ltd., Sydney Place, London, S.W.7. — Pamphlet illustrating and describing a miniature low-priced projector for film strip. Also an illustrated catalogue of "strip text-books" on many subjects.

Wardle Engineering Co., Ltd., Old Trafford, Manchester, 16. — Catalogue (No. L.34) and price list of commercial and industrial lighting equipment.

Craven Brothers (Manchester), Ltd., Vauxhall Works, Reddish, Stockport.—Technical brochure (No. 1-49) describing gear hobbing machines.

Romac Industries, Ltd., (Radio Division), The Hyde, Hendon, London, N.W.9.—Priced folder illustrating bus and coach intercommunication equipment.

The Applied Heat Co., Ltd., Elecfurn Works, Watford By-Pass, Watford, Herts. —Illustrated brochure (GK.449) describing "Grafton" electric kilns.

Frank Whitelegg, 11-13, Regent Parade, Sutton, Surrey.—Two leaflets on chain link netting machines and hand-bending machines for wire and strip.

Wm. Sanders & Co. (Wednesbury), Ltd., Falcon Electrical Works, Wednesbury, Staffs.—Folder on the "Sandsbury" consumer's electricity control unit.

Hygienic Wire Works, Ltd., 79, Miles Road, Mitcham, Surrey.—Catalogue of "Genyk" pressed-steel conduit fittings.

Micramatic, Ltd., Melco Works, Congleton, Cheshire.—Two priced folders illustrating cold- and hot-cathode lighting fittings.

NEW BOOKS

Magnetic Control of Industrial Motors. By G. W. Heumann. Pp. 583; figs. 365; index. Chapman & Hall, Ltd., 37, Essex Street, London, W.C.2. Price 45s. in U.K.

This substantial American book is undoubtedly a work of importance to all concerned with the theory and practice of magnetic control or contactor gear. The author is so obviously at ease with the various aspects of the subject that this may account for the readability of his style. Credit must also be given for the facility with which he takes up and uses in quick succession the tools required for his purpose, e.g., principles, definitions, characteristic curves, tables, diagrams, practical notes and the like. A noteworthy feature tending to eliminate superfluous wording without loss of substance is the use of the "per unit" system to represent the performance characteristics of motors and controllers.

The impression is given that contactor gear is more commonly employed in the U.S.A. than in this country, and that over there it covers a wider field of application. On the other hand it is possible to infer from the illustrations that British products are not inferior in style or quality. The star-delta starter, which is, or was, esteemed by many British engineers as a convenient compromise between direct starting and stator/rotor starting, receives but short shrift: "Wye-delta starting is used widely in Europe but has not become common practice in the United States." This difference of practice may be the result of the small systems of pioneer days in this country. Incautious starting arrangements could sometimes reduce lighting to a temporary condition known as "hair-pin red," as many engineers may remember.

The book is cordially recommended to all concerned with the design and application of contactor gear.—J. P. S. P.

Principles and Practice of Radar. By H. E. Penrose. Pp. 692; figs. 515; index. George Newnes, Ltd., Tower House, Southampton Street, London, W.C.2. Price 42s.

In his preface the author indicates that this book has been written mainly for maintenance personnel working on marine and aircraft radar. The minimum technical knowledge assumed is that of a first class P.M.G. certificate. The first hundred pages are occupied by material of an elementary nature. The rest of the book describes the units of a radar system, without using mathematics or giving any design criteria. Some of the more "modern" topics, such as wave-guides and cavity resonators, are discussed in appendices.

There is a growing need for improved literature of this sort and there are difficult problems to be overcome in reducing the mathematics to the minimum. To succeed in making radar intelligible to non-engineers it is necessary to make all descriptive matter clear, concise and physically accurate. Mr. Penrose varies from good to very poor. His explanation of velocity modulation is quite unintelligible, and he appears to think (Fig. 49) that a magnetically focused cathode-ray tube has several image points between lens and screen, one located exactly in the centre of the lens. In the section on receivers, no mention of intermediate frequency strips can be found. The circuit descriptions are, on the whole, adequate, but many more numerical values should be included so as to give a proper understanding of how the circuit constants determine the operation.

In my opinion the writing of a really correct and detailed account of radar practice is beyond the power of a single individual. Mr. Penrose has made a brave attempt, but it is only an attempt.—A. H. B.

Radar Scanners and Radomes. By W. M. Cady, M. B. Karelitz and L. A. Turner. Pp. 491; figs. and index. McGraw-Hill Publishing Co., Ltd., Aldwych House, London, W.C.2. Price 42s. in U.K.

This book deals very effectively with problems of the design and installation of radar scanners in ships, aircraft and ground stations. The first part presents a comprehensive survey of the mechanical and electro-mechanical considerations involved in the design of satisfactory scanners. Although of greater interest to the mechanical engineer, the considerations merit study by the electrical engineer because of their effect upon aerial design. The general kinematics and mechanical loading are thoroughly discussed in chapters 3, 5 and 6, together with examples of typical applications. In this section of the book, the main emphasis is upon mechanical design. The aerial and waveguide information, which is necessarily quoted, is better and more accurately obtained from other books which deal specifically with these subjects. This particularly applies to data relating to radio frequency design and performance.

The problems involved in stabilizing scanners against roll of a ship or aircraft are also discussed, representative equipment being fully described. The need for moving the scanning beam, in radar, is

inter-related with the requirement for repeating the motion and position of the beam. This information can only be obtained within and from the scanner itself. Electrical drive and repeater systems are therefore an integral part of the scanner. This aspect is discussed, with particular emphasis upon the application of servo systems to scanner control mechanisms.

The most comprehensive and up-to-date treatment in existence of radomes for scanners is provided in the second part of the book, together with an excellent dissertation upon the characteristics of various plastic dielectrics, and the reflection of electro-magnetic waves at all angles of incidents from dielectric surfaces. The radio characteristics of the radome are, in this way, analysed with exactness. This is followed by a similarly thorough discussion of mechanical strength, aerodynamics and the methods employed to form plastics with suitable electrical characteristics into radomes of the required contour.—L. W. B.

The "**Handbook on Electroplating**" by the technical staff of W. Canning & Co., Ltd., reviewed on page 955 of last week's issue, is sold at 21s, postage paid. The price of the "**Standard Handbook for Electrical Engineers,**" edited by A. E. Knowlton and published by the McGraw-Hill Publishing Co., Ltd., was, we regret, given incorrectly; it should be 72s in U.K.

Canadian Exports

THE Canadian Government, whose promptness in issuing trade statistics is commendable, has just published export returns for 1948. The principal groups and countries of destination of electrical shipments are shown in the table below.

Prominent among decreases were storage batteries, power plant, sparking plugs, etc., and a considerable total of unspecified apparatus. On the other hand there were increases in other kinds of batteries, meters and stoves. Outstanding markets were South Africa, Brazil, Venezuela and the West Indies.

Class of Goods and Destinations	1948 $(000)	Inc. or dec. on 1947 $(000)
Batteries, storage	1,760	− 655
To Holland	139	− 31
,, South Africa	554	+ 5
,, India	11	− 92
,, Malaya	96	− 19
,, Colombia	77	− 56
,, Venezuela	173	+ 3
Batteries, other	462	+ 156
To Ceylon	263	+ 70
,, Dutch E. Indies	136	+ 136
Radio receiving sets	893	− 712
To South Africa	181	+ 168
,, India	59	− 43
,, Brazil	115	+ 252
,, Venezuela	140	+ 56
Radio apparatus, other	1,541	+ 405
To China	459	+ 405
,, France	200	+ 148
Dynamos, generators and parts	1,012	− 300
To Salvador	40	+ 40
,, New Zealand	170	− 712
,, India	24	+ 12
,, Australia	45	+ 14
,, South Africa	82	+ 32
,, Brazil	482	+ 330
Motors and parts	2,907	− 350
To Australia	534	+ 40
,, New Zealand	404	+ 27
,, Britain	94	+ 54
,, Brazil	301	+ 81
,, China	155	− 202
,, South Africa	115	+ 80
,, Mexico	156	+ 88
,, Venezuela	223	+ 175
,, Yugoslavia	138	+ 138
Transformers and parts	389	− 139
To Jamaica	28	+ 26
,, Chile	27	+ 27
,, Mexico	24	+ 10
,, Sweden	23	+ 23
Meters and parts	1,628	+ 471
To Brazil	105	+ 26
,, Chile	112	− 9
,, Colombia	84	− 7
,, Cuba	228	+ 95
,, Mexico	336	+ 6
,, Venezuela	153	+ 69
Electric stoves	2,768	+ 1,074
To South Africa	2,406	+ 1,528
,, Colombia	26	+ 22
,, Iceland	21	− 6
,, Eire	102	+ 13
Other domestic cooking and heating devices	348	− 92
To South Africa	256	+ 100
,, Eire	25	+ 25
Telegraph and telephone apparatus	324	+ 191
To Brazil	78	+ 65
,, China	155	+ 152
Spark plugs, magnetos etc.	1,219	− 542
To South Africa	355	− 41
,, Belgium	109	+ 11
,, India	72	+ 10
,, Australia	87	+ 87
,, Brazil	25	− 69
,, Venezuela	60	+ 22
,, Mexico	149	+ 88
,, Uruguay	50	+ 43
,, Holland	56	− 37
Electrical apparatus, n.o.p.	1,009	− 1,948

Trade with Canada

Adverse Factors Faced by Manufacturers

By
JOHN C. HANCOCK

THE increase in the adverse balance of trade, amounting to £44,593,709, revealed in the April trade statistics must be regarded as serious. Electrical traders and manufacturers should be so well aware of the vital need to increase our exports to North America, and to Canada in particular, that any restatement of the facts appears to be unnecessary. The promise of Government assistance to promote the sale of United Kingdom goods in the dollar area, announced by Mr. Harold Wilson, President of the Board of Trade, on 11th April, will no doubt meet with the approval of all prospective, and active, exporters.

Competition Not Feared

In making known the Government's "Eight-point Plan" the President did utter the warning that United Kingdom manufacturers would have to face severe competition from both the United States and Canadian manufacturers. But British industry is used to meeting competition at home and overseas; were that the only obstacle electrical traders and manufacturers had to contend with, the prospect could be faced with businesslike composure.

Other and perhaps more potent factors militate against the United Kingdom exporter to Canada which, unless Mr. Wilson, who has recently visited Canada, has persuaded his opposite number over there to remove, or at least to moderate, may dash the hopes of the Government and nullify the efforts of British exporters. The factors referred to, though not necessarily set down in order of "nuisance value," are: (1) Canadian Standards and Approvals Regulations. (2) Canadian Emergency Exchange Conservation Act. (3) Canadian Dumping Duty.

Readers of the *Electrical Review* will be familiar with most of the requirements of the Canadian Standards Association, and doubtless many manufacturers will have gained first-hand experience in trying to get items of equipment piloted through the tortuous maze of the Approvals Division of the C.S.A.

Canadian provincial laws require the approval of all electrical devices and equipment which are intended for installation and use by the public in Canada. Thus, electrical goods such as vacuum cleaners, washing machines, smoothing irons, coffee percolators—and, in fact, any apparatus which will be operated or used by the "non-technician"—as well as electric light fittings and house wiring systems which may be installed by an electrical contractor on supply authorities' mains, need the approval of the C.S.A. The only exceptions to this rule are items of equipment used in mines, aircraft and marine work, and plant used in premises operated by electric power concerns and electric railways. An excellent article dealing with the technical aspect of the C.S.A. appeared in the *Electrical Review* of 4th February last.

The operation of the Emergency Exchange Conservation Act creates something in the nature of a "closed shop" for many British electrical products—notably domestic and other appliances. This Act defines what goods may, and may not, be imported into Canada, the three schedules of goods being broadly classified thus: (1) Prohibited list. (2) Quota list. (3) Permitted list.

How the "Lists" Operate

Little or no explanation is needed to gather the significance of these headings, though goods in the "Quota list" may be imported freely into Canada from the sterling area, the quota arrangements applying only to dollar imports. The sole items of interest to electrical traders and manufacturers are vacuum cleaners and cooking and heating apparatus.

On the "Prohibited list" are such items as radio receiving sets, washing machines, electric signs, dry shavers, domestic electric light fittings, refrigerators and so on. As if trying to

make amends for this sweeping prohibition of "consumer" electrical goods, Schedule 3 permits the importation of *complete parts, for production use,* of, among other things, radio apparatus, washing machines and dry shavers, together with the useful item: "Complete parts of electric apparatus not otherwise provided for." Exporters are, however, strongly recommended to study the full text of this Act, copies of which may be obtained from the Commercial Counsellor for Canada, Canada House, Trafalgar Square, London, S.W.1.

Dumping Duties

The regulation concerning dumping duties says: "In the case of goods exported to Canada of a class or kind made or produced in Canada, if the export or actual selling price to an importer in Canada is less than the fair market value or the value for duty of the goods as determined under the provisions of the Customs Act, there shall, in addition to the duties otherwise established, be levied, collected and paid on such goods, on their importation into Canada, a special or dumping duty, equal to the difference between the said selling price of the goods for exports and the said value for duty thereof; and such special or dumping duty shall be levied, collected and paid on such goods although not otherwise dutiable."

Goods are not considered to be of a class or kind produced in Canada unless a quantity sufficient to supply 10 per cent of the normal Canadian consumption can be produced; bona fide trade samples are generally exempt from dumping duties.

The application of this duty can perhaps better be appreciated by means of an example. Let us suppose that a dutiable item of equipment, the fair market value of which is £100, is being sold to a Canadian purchaser for £80, the combined duties would be assessed as follows: Fair market value £100 at (say) 15 per cent *ad val.*, £15; selling price £80: dumping duty equals difference, £20; total duty, £35. This represents an effective duty of about 44 per cent in the example instanced—an impossible proposition for any Canadian purchaser! (A declaration of value signed by the exporter forms part of the Canadian invoicing requirements.)

The Canadian authorities are always prepared to consider the waiving of dumping duties provided the exporter can make out a good case, but before deciding on this course several considerations have to be borne in mind. The chief point is that if dumping duties are suspended on a specified product then all goods of the same type, irrespective of the country of origin, must be accorded the same privilege. This factor cannot be ignored.

If it were possible to obtain remission of the dumping duties on British goods only, some benefit might result. However sympathetic the Canadian authorities may feel towards British goods, indications are that such a step could not be taken, since, under the so-called Havana Charter and G.A.T.T. (General Agreement on Tariffs and Trade), no preferences may be accorded by one country to any other country without the reduction being shared by all the other signatories to the agreements.

Coil Spring Conference

THE annual general meetings of the Coil Spring Federation and its associated research organization, held at Bournemouth, were presided over by Mr. R. S. Bache. On the evening of 27th May there was a lecture by Dr. J. A. Hope (Sheffield University) who dealt particularly with surface effects in spring design, the factors concerned in the pre-stressing or "scragging" of springs, and an exploration of the possible directions of shot peening. The work described indicated possible methods by which the strength of springs could be improved and various lines of future research.

On the following morning, after the presidential address, there was a talk on co-operative industrial research by Mr. C. A. Spencer, secretary in charge of Research Associations of the D.S.I.R. Both addresses stressed the desirability of establishing in each industry a permanent means of carrying out suitable scientific development work. Mr. R. S. Bache was unanimously re-elected president and reports on the work of the Research Committee and on the progress of research were given by Mr. H. Singleton, chairman, and Dr. R. Genders, director, respectively. There was an official luncheon and civic reception.

The morning of 29th May was occupied by a well-attended technical session in which four lectures were presented by the research staff covering the field of the present programme.

Industry and the House

Government Bulk Purchasing

By F. J. ERROLL,
M.A., A.M.I.E.E., M.P.

THE House completed its final week of business before the Whitsun Recess to the accompaniment of growing industrial unrest. The grievances of the railwaymen and the prospect of a serious Whitsun railway strike did little to cheer Labour M.P.s getting ready to go to Blackpool for their party's annual Whitsun conference. In the previous week, Mr. Gaitskell's forthright speech to the Electrical Trades Union on the importance of management and individual responsibility in the nationalized electricity supply industry caused some dismay amongst those of his colleagues in the House who still press for a greater share of workers' control in industry. The nationalized industries, it seems, are not making a very good showing in the field of labour harmony.

Raw Materials and Food

The debate on bulk purchase, initiated by the Opposition, came as something of a revelation to all Members of the House. Few, except those who had studied the matter deeply, realized the extent of Government commercial transactions in the procurement both of industrial raw materials and essential foodstuffs. The general plan of the debate was that the first half of the day should be devoted to the purchase of industrial raw materials, and the second half given over to the activities of the Minister of Food. As the day wore on several Members referred to both aspects of the matter, and since the Minister of Supply followed immediately after Mr. Oliver Lyttelton, who was the opening speaker, really no effective reply was given to subsequent speakers who dealt with non-ferrous metals, the Minister of Food confining himself when closing the debate to the work of his own Department.

In opening the debate, Mr. Lyttelton showed that bulk buying was unsound in theory and in consequence it worked out badly in practice. He condemned particularly the bulk purchase of non-ferrous metals such as copper, which in a falling world market was being sold to the British manufacturer at a price about £40 a ton above the United States price. Lately there had been a reduction. The fine against the British manufacturer was now £23 a ton compared with international competitors. That was the extra price which he had to pay against foreign competition. If we looked to zinc, the same thing applied. With regard to lead, very much the same differentiation existed. To-day the British manufacturer had to pay £16 or £18 more than the world competitive price for lead, which resulted in the price of a battery being 12 to 14 per cent above that of a foreign battery.

Mr. Strauss, the Minister of Supply, who had great experience himself in the pre-war metal markets, made a vigorous defence of the bulk purchasing policy of his Department. He claimed that "our industry and our people have received immense benefits through the policy of bulk buying." It was true that the prices of some non-ferrous metals were higher at present in this country than in the United States, but he did not agree that the price differential was having a damaging effect on Britain's export trade.

Effect in Buyer's Market

Taken over the whole field, our exports consisted only to the extent of 15 per cent of imported raw material. If, therefore, there was a price differentiation of even as much as 10 per cent the difference in the price of the British finished article would only be about 1½ per cent. What Mr. Strauss did not explain was that a price difference of 1½ per cent may not have mattered when a sellers' market prevailed, but it matters very much now. Conditions are very different to-day, and overseas buyers realize that they have only to hold off for further price falls to take place.

The Chancellor's proposal to increase telephone rentals and telephone charges was discussed for half of a Supply Day. The debate went off to a slow start because it had to take place on the Vote to the Postmaster-General whereas the

increased rentals and charges were announced by the Chancellor and were intended mainly as a tax-collecting device. The absence of any representative from the Treasury during most of the debate was to be regretted. The statements then made have been partly superseded by the Chancellor's more recent announcement that the proposals for increasing the rentals will not now be proceeded with. It seems that he has decided on this course "after consultation with the Postmaster-General."

It really seems extraordinary that such consultation could not have taken place before the Budget announcement was made. The administrative difficulty of individually terminating three million contracts must have been realized earlier. This is another example of a scheme which may have looked feasible on paper but proved unsatisfactory when exposed to the scrutiny of Parliament.

The Iron and Steel Bill has passed its second reading in the House of Lords. The Commons are now waiting to see whether the Government will accept the proposal of Lord Salisbury, the Leader of the Opposition Peers, to defer the earliest possible vesting date for the industry to 1st October, 1950, well after the last possible date for the holding of a General Election.

If the Government decides to refuse to accept such an amendment, the original date, 1st May, 1950, will be written back into the Bill by the Commons, by the simple process of rejecting the Lords' amendment when it is sent down to them. The Lords will then have to decide whether to accept this defeat or throw the whole Bill out. Should they adopt the latter course the Government has the Parliament Bill in readiness by which to force the Steel Bill through over the heads of the Lords.

Registered Electrical Contractors

THE annual general meeting of the National Register of Electrical Installation Contractors was held on Wednesday at the E.L.M.A. Lighting Service Bureau, London. In the annual report of the Registration Board it was stated that to preserve contact with the supply section of the industry following nationalization Messrs. R. Birt, Norman Elliott, D. B. Irving and E. A. Mills were elected to serve on the Board in their personal capacities pending more permanent arrangements. Following the resignation of Capt. J. M. Donaldson the I.E.E. nominated Mr. R. H. Rawll in his place. The deaths were recorded with regret of Mr. A. H. Dykes and Mr. H. M. Winstanley, both representatives of the Association of Consulting Engineers. Mr. Dykes was one of the original members of the Board and for many years served as vice-chairman.

Thanks largely to revenue from sale of publicity material the income for the year ended 31st December, 1948, showed an increase over that of the previous year, while expenditure fell. There was a deficit of £1,247 as compared with £3,136 in 1947. Sixty-two new certificates were issued during the year and four names were reinstated, while 51 names were deleted from the Register. At 31st December the total number on the Register was 1,062.

During the year inspections were made of the work of 104 applicants for registration and in addition routine re-inspections were made of the work of 488 certificate holders, involving the examination of 1,140 installations. The report added that the advent of nationalization had materially assisted the Register to bring home to the authorities concerned instances of faulty work carried out both by contractors and Area Boards. All the 14 Electricity Boards and the North of Scotland Hydro Electric Board had indicated their intention to carry out installation work as a part of their service to the consumers and, moreover, had made it clear that they intended to see to it that a safe and proper standard of work was maintained. Consequently it had now been possible to bring at once to the attention of these Boards examples of faulty work and this had resulted in a material tightening up of inspections. Important negotiations had been continued with the B.E.A. regarding the precise functions of the N.R.E.I.C. in future and these were still proceeding. With nationalization local advisory committees had been disrupted but a scheme was now being formulated for setting up new committees with similar duties based on the 14 Area Boards and the North of Scotland Hydro-Electric Board.

Telecommunications in Queensland

A three-year programme of the Commonwealth Postmaster-General's Department for extensions in Queensland involves an estimated expenditure of £8,000,000 on new and enlarged exchanges, new trunk lines, carrier-wave trunk equipment, etc.

Resale Price Maintenance

LLOYD JACOB COMMITTEE'S REPORT

IN 1947 a committee was appointed by the President of the Board of Trade, under the chairmanship of Mr. G. H. Lloyd Jacob, "to consider the practice by which minimum wholesale and retail prices or margins for the resale of goods are fixed by producers, and its effects on supply, distribution and consumption, and to report whether, in the light of present conditions, and particularly of the need for the maximum economy and efficiency in the production and distribution of goods, any measures are desirable to prevent or regulate its continuance."

The Committee's report was published last week (Cmd. 7696, H.M. Stationery Office, 2s 6d). In the course of this 122-page document the Committee reviews the evidence and in its conclusions draws a distinction between the fixing and maintenance of resale prices by an individual manufacturer and by collective methods. In the first case it considers that the manufacturer of a branded article remains responsible for the quality of his goods and therefore cannot be indifferent to the terms on which his goods are sold to the public. It consequently recommends that no action should be taken to deprive an individual producer of the power to prescribe and enforce resale prices for goods bearing his brand.

Consultations with National Organizations

On the other hand, the Committee thinks the producers are not entitled "to use resale price maintenance to obstruct the development of particular methods of trading, to impede the distribution by another manufacturer of competitive goods or to deprive the public of the benefits of improvement in distribution." It recommends that the Government Departments concerned should consult the principal national organizations in trade and industry for the purpose of considering the best means of making this policy effective.

The Committee can find no adequate reason to justify a manufacturer either in interfering with the terms on which the distributor disposes of another manufacturer's goods or in surrendering any part of his interest in the resale of goods bearing his brand for this purpose. The Committee says:—"Associations of traders designed to bring their collective power to bear to maintain their members' prices are, in our view, undesirable and we note that the Commission set up under the Monopolies and Restrictive Practices (Inquiry and Control) Act, 1948, has already been asked by the Board of Trade to investigate two of the industries from which we received evidence."

Part II of the report contains accounts of collective resale price maintenance schemes in the distribution of fifteen classes of goods. Included in this section are electrical goods, electric lamps, radio valves and refrigeration equipment. The Electrical Fair Trading Council is dealt with; its General Principles and Policy are set out in full.

Lamp Manufacturers' Policy

The history of the Electric Lamp Manufacturers' Association is briefly given and it is shown that its objects are to promote and protect the interests of the public, the trade and the producers; to promote agreements between the members for the exchange of patents and experience; to improve the use of their manufacturing facilities; to raise the standards of illumination; and standardize the product and develop more efficient methods in its manufacture and distribution. Examples of the discounts and rebates allowed are given, reference being made to special terms for "exclusive agreements. It is noted that no attempt is made to prevent co-operative societies giving discounts on electric lamps. Representatives of E.L.M.A. told the Committee that costs of production and distribution were constantly watched so that any economies could be reflected in the prices. The price of the 60 W general service lamp had been reduced from 4s in 1922 to 1s 3d (exclusive of purchase tax) in 1945. [Since 1st June it has been 1s 1d.]

Sales of E.L.M.A. lamps rose from 7½ million in 1938 to 113 million in 1947, but sales of non-Association lamps showed a proportionately greater increase.

The report refers to the operation of a "stop list" (on which there were only three names in 1947), and says that manufacturers wishing to compete with E.L.M.A. have had to build up their own distribution system and offer much larger discounts to distributors.

Arrangements existing among members of the British Radio Valve Manufacturers' Association and resellers are next dealt with. The Fair Trading Codes established by the British Refrigeration Association are described in the next section, reference being made to its conditions of sale, the fixing of maximum allowances for "traded-in" refrigerators, guarantees and servicing arrangements.

FINANCIAL SECTION

Company News
Stock Exchange Activities

Reports and Dividends

Associated Electrical Industries, Ltd.—The Rt. Hon. Oliver Lyttelton (chairman) speaking at the annual meeting on 1st June said that the volume of production in 1948 was approximately 18 per cent higher than that of 1947. The present heavy taxation would retard and ultimately prevent industries from being kept up to date, although long-established companies like their own would feel the effects much less than others. Their smaller subsidiaries had been regrouped and consolidated into bigger companies. The recapitalization and reorganization of the Edison Swan Electric Co., Ltd., which included the absorption of Edison Swan Cables and the Cosmos Manufacturing Co., had been completed. In their cable business new plant had been installed, particularly in the paper cable section. They had completed the first contract for a 33,000 V cable for the British Electricity Authority.

The new factory at Sunderland, where the Edison Swan Co. produced radio valves, enabled them to contribute to the diversification of industry in an area which had specialized chiefly in shipbuilding. The establishment of a factory at Motherwell had enabled them to move the production of meters from Trafford Park and to extend the manufacture of X-ray apparatus by Newton Victor, Ltd. In their Hotpoint group they had bought the balance of the shares in Premier Electric Heaters, Ltd., and this company had become a manufacturing and selling division of the Hotpoint Co. Another manufacturing division was the commercial refrigerator plant of the International Refrigerator Co., at Llandudno Junction. The financial consolidation of these companies with the Hotpoint Co., would follow in due course. The Peterborough factory, which manufactured domestic refrigerators and washing machines, was still being operated by the B.T.H. Co., but would eventually form a third manufacturing division of the Hotpoint Co.

Their overseas investments included a 50 per cent holding in the Australian General Electric Proprietary and a substantial shareholding in the Vanderbijl Engineering Corporation of South Africa. They had also bought the business of L. H. Mathinusen in South Africa, and with the Anglo-American Corporation, had acquired a controlling interest in the First Electric Corporation.

At the end of 1948 their order book was nearly 15 per cent higher than at the end of 1947. They had continued to receive orders in 1949 at the same high rate. Among the contracts carried out by the group the chairman mentioned the turbo-generators and switchgear supplied for the Kingston-on-Thames power station, the first hydrogen-cooled generator built in this country, for Littlebrook, and generating plant for Battersea, Staythorpe, Clarence Dock, Liverpool, and other power stations. Among export orders were two large sets for New South Wales, four sets for Uganda, two for the Western Australian Government and new orders for mining machinery valued at about £1,000,000 for the Orange Free State.

The A.E.I. research station at Aldermaston was now well established, and the research departments at Trafford Park and Rugby had had a record year of activity. The amount expended on research exceeded £1,000,000 per annum.

Sales of lamps and lighting equipment fell off considerably during the year, although the total business transacted was slightly higher than in 1947. A.E.I. and the General Electric Co., Ltd., had formed a new company, Glass Bulbs, Ltd., with a capital of £1,000,000. This company was erecting buildings at Harworth, Yorks, and would install in them two ribbon machines for the production of electric lamp bulbs. One machine operating at maximum capacity could produce over 200 million bulbs a year, sufficient for the whole industry in this country. In anticipation of this production they had reduced, in agreement with other lamp manufacturers, the prices of many of their lamps.

The proportion of their business which was devoted to export had continued to expand during the year and showed no sign of falling off. In a buyers' market they should still be able to hold their place as one of the world's leading exporters of electrical equipment.

Heatrae, Ltd., reports a trading profit for the year ended 28th February last of £33,903, as compared with £48,885 for the preceding year, and a net profit of £11,637 (against £22,693), to which is added £7,380 brought in making £19,017. It is proposed to pay a dividend of 12½ per cent, less tax, for the year on the ordinary shares (unchanged) and to carry forward £14,755.

In his statement circulated with the report and accounts, Mr. C. H. Smith (chairman) says that the increase in purchase tax to 100 per cent had a disastrous effect upon the company's water heater business; orders for many thousands of heaters were cancelled. To counter this the company is carrying out useful sub-con-

tracts by constructing parts for agricultural machinery, sterilizing equipment and machinery, for the food-preserving industry. Several good contacts have been made with new customers overseas and business with the catering trade has satisfactorily developed.

Babcock & Wilcox, Ltd.—The statement by Sir John Greenly (chairman) which was circulated with the report and accounts was reviewed in our issue of 20th May. At the annual meeting held on 31st May, Sir John mentioned that an application had been made to the Capital Issues Committee for consent to the issue of new preference and ordinary capital, and as soon as this consent was received, notices convening an extraordinary meeting to increase the capital would be sent to stockholders.

The British Vacuum Cleaner & Engineering Co., Ltd., reports a net profit for the year to 30th September last of £52,110, as compared with £73,502 for the previous year which included £10,804 profit on the sale of capital assets. The ordinary dividend is maintained at 20 per cent.

S. Guiterman & Co., Ltd., report a consolidated trading loss for 1948 of £17,194, as compared with a trading profit of £52,350 for 1947, and a net loss of £23,338 (against a profit of £41,787), less tax credit of £14,000. No ordinary dividend is proposed (against 15 per cent and a bonus of 10 per cent).

H. J. Baldwin & Co., Ltd., propose to increase their authorized capital to £250,000 by creating 50,000 6 per cent £1 cumulative preference shares and 500,000 ordinary shares of 2s each. The preference shares will be offered to existing preference holders in the ratio of one for one at 25s each. Ordinary shareholders will be offered 200,000 of the new ordinary shares at 6s each in the ratio of one for every five held.

Charles Clifford & Sons, Ltd., report a net profit for the year ended 31st December last of £45,895, as compared with £48,231 for the preceding year. After making certain appropriations and paying a second interim ordinary dividend of 2s 6d per share, making 3s 6d per share, free of tax, the balance carried forward is £40,803 (against £42,666 brought in).

Kalgoorlie Electric Power & Lighting Corpn., Ltd., recommends a dividend of 7 per cent less tax, for the year to 31st December last (same). The profits are £28,356 (£26,360) to which has been added net overprovision for taxation in previous years £603 (£3,848). Depreciation reserve receives £10,000, general reserve £4,500, and provision for taxation £7,373.

The Telephone Manufacturing Co., Ltd., reports a net profit for 1948 of £209,376, as compared with £103,918 for the preceding year. The dividend for the year is maintained at 9 per cent, less tax, by a final payment of 6½ per cent.

The London Electric Wire Co. & Smiths, Ltd., reports a profit for 1948, including provision no longer required, of £98,924, plus tax adjustment relating to previous years of £159,420 and to current year of £220,897, making a balance of £479,241. General reserve receives £200,000 and dividend equalization reserve £150,000. The final ordinary dividend is 6 per cent (against 7½ per cent), making 10 per cent (same) for the year. The balance carried forward is £226,015 (against £150,898 brought in).

Worthington-Simpson, Ltd., report a consolidated trading profit for 1948, with investment income, of £378,159, as compared with £256,175 for 1947, and a net profit of £129,779 (against £92,847). The ordinary dividend for the year is unchanged at 20 per cent, and £82,480 is carried forward (against £42,990 brought in).

Vactric, Ltd., has announced that the dividend on the 6 per cent cumulative preference due on 1st June will not be paid. The preference are in arrears from 2nd December, 1947.

Increases of Capital

John Morris Electrical Engineering Co., Ltd.—Increased by £6,000, in £1 ordinary shares, beyond the registered capital of £4,000.

Ceag, Ltd.—Increased by £100,000, in £1 ordinary shares, beyond the registered capital of £50,000.

Kelvinator, Ltd.—Increased by £285,000, in £1 ordinary shares, beyond the registered capital of £215,000. On 12th May, 1948, Nash Kelvinator Corporation, of Detroit, U.S.A., held 214,993 shares.

New Companies

G. S. Peters, Ltd.—Registered 20th April. Capital £100. Manufacturers of and wholesale and retail dealers in electric lamps and electrical goods of all kinds, etc. Directors: Wm. E. Seex and R. F. Heal. Regd. office: 109, Jermyn Street, S.W.1.

Fred Graham, Ltd.—Registered 26th May. Capital £3,000. Electrical, radio and television engineers and contractors, etc. Directors: F. Graham and Edith Graham. Regd. office: 24, New Market Street, Blackburn.

R.E.W. (Earlsfield), Ltd.—Registered 23rd May. Capital £1,500. To acquire the business of radio and electrical engineers now carried on by C. A. Corke at 320, Garrett Lane, Wandsworth, S.W.18, as Radio and Electrical Workshops. Direc-

tors: C. A. Corke and Mrs. G. M. Corke. Regd. office: 320, Garrett Lane, Earlsfield, S.W.18.

Radio Service Specialists (Stockport), Ltd.—Registered 3rd March. Capital £100. Directors: R. C. Applegate and H. F. Applegate. Regd. office: 270, Adswood Road, Adswood, Stockport.

Pearsons Installations, Ltd.—Registered 23rd May. Capital £100. Heating, ventilating, lighting, electrical, radio and general engineers, etc. Directors: G. Pearson, G. D. Pearson, Marjorie Bindloss and S. Snowball. Regd. office: Brunswick Terrace, Leeds, 2.

Electrical Supplies (Stevenage), Ltd.—Registered 23rd May. Capital £500. Manufacturers of and dealers in artificial lighting apparatus, electrical plant, machinery, fittings and accessories, neon and other signs, radio, etc. Directors: W. J. Burrows, J. J. Burrows, and Mrs. P. I. Burrows. Regd. office: 5, Middle Row, Stevenage.

Sanderson and Son (Woodlands), Ltd.—Registered 19th May. Capital £1,000. Electrical contractors, etc. Directors: Geo. R. Sanderson and Doris I. Sanderson. Regd. office: 230, Great North Road, Woodlands, Doncaster.

Sellers of Leeds, Ltd.—Registered 19th May. Capital £5,000. Electrical, lighting, heating, ventilating, wireless, mechanical and general engineers, etc. Directors: H. W. Sellers, and Edith M. Sellers. Regd. office: 46, Park Square, Leeds, 1.

L. Lane (Wincanton), Ltd.—Registered 19th May. Capital £15,000. To acquire the business of an electrical and radio engineer carried on by L. E. W. Lane at South Street, Wincanton. Directors: L. E. W. Lane, Mrs. Olive M. Lane and C. L. Rutter. Regd. office: South Street, Wincanton.

L. P. & M. Engineers, Ltd.—Registered 4th April. Capital £3,000. Dealers in all kinds of electrical plant and equipment. F. W. E. Gradwell signs as director. Regd. office: 2a, Bina Gardens, S.W.5.

C. J. Lally & Co., Ltd.—Registered 28th April. Capital £500. Electrical engineers and general electrical installation contractors, wireless engineers and service agents, etc. Directors: C. J. Lally and W. P. Collins. Regd. office: 7, Burwood Mews, Paddington, W.2.

Bankruptcies

N. A. Peters, carrying on business at 192, Robin Hood Lane, Hall Green, Birmingham, electrical and wireless engineer. —Application for discharge to be heard on 29th June at the Court House, Corporation Street, Birmingham, 4.

T. G. Coaton, carrying on business at 16, Humberstone Road, Leicester, electrical engineer, under the style of T. G. Coaton & Co.—Last day for receiving proofs for dividend 15th June. Trustee, Mr. G. S. Robinson, 1, Wycliffe Street, Leicester, Official Receiver.

G. S. Douthwaite, carrying on business at 25, Dean Street, Newcastle-on-Tyne, under the style of G. S. Douthwaite & Co., electrical engineer.—Last day for receiving proofs for dividend 15th June. Trustee, Mr. A. K. Ferguson, Gibb Chambers, Westgate Road, Newcastle-on-Tyne, 1, Official Receiver.,

Trade Marks

APPLICATIONS have been made for the registration of the following trade marks. Objections may be entered within a month of 1st June:—

THERMEX. No. 649,971. Class 9. Apparatus for producing and utilizing high frequency currents and high frequency electric and magnetic fields, and parts of such apparatus, all being goods in Class 9, but not including wires or cables or any goods of the same description as wires and cables.—The Girdler Corporation, Louisville, Kentucky, U.S.A. Address for service, c/o Stevens, Langner, Parry & Rollinson, 5-9, Quality Court, Chancery Lane, London, W.C.2.

HALDA. No. 658,769. Class 9. Calculating machines, accounting machines, time-recording machines and cash registers, and parts of and fittings for all such goods, all included in Class 9: and apparatus for the transmission of electrical energy, telegraphic apparatus, telephonic apparatus, and cinematographic, optical, geodetic, weighing, measuring and signalling apparatus and instruments; but not including wire.—Halda Aktiebolag, Svangsta, Sweden. Address for service, c/o Cruickshank & Fairweather, 29, Southampton Buildings, Chancery Lane, London, W.C.2.

No. 669,645 (design). Class 9. Electrical apparatus and instruments, and parts thereof and fittings therefor, all included in Class 9; and insulated and fuse wire. No. 669,646. Class 10. Electrically heated bed warmers, electrically heated blankets, and electrically heated pads, and parts of all such goods included in Class 10.—Electrothermal Engineering, Ltd., 270, Neville Road, London, E.7.

JENCONS (design). No. 672,337. Class 9. Electrical apparatus and instruments included in Class 9; and scientific, photographic, cinematographic, optical, weighing, measuring, signalling, checking (supervision), and teaching apparatus and instruments.—Jencons (Scientific), Ltd., Rosebank Works, Rosebank Way, Acton, London, W.3.

KLIMOS. No. 673,679. Class 9. Electric domestic floor polishing machines.—Klinos Industrial Products, Ltd., Fenwick House, 292, High Holborn, London, W.C.1.

PAXOLIN. No. 672,773. Class 17. Electrical insulating materials.—The Micanite & Insulators Co., Ltd., Empire Works, Blackhorse Lane, Walthamstow, London, E.17.

STOCKS and SHARES

STOCK Exchange markets have recovered to a very slight extent from the worst of the malaise which spread from one end of the House to the other during the fortnight before Whitsun. Hardly any of the various departments failed to suffer from the effect of the depression that followed upon the industrial unrest. Strikes—and threats of strikes—at home; political unsettlement abroad, and a vague feeling of uneasiness aroused by a variety of contributory causes, led to a certain amount of selling on behalf of nervous investors, and to a noticeable absence of buying from private investors.

What little buying did come into the markets appeared to be mainly on behalf of institutional bodies though this was not sufficient to counteract the constant stream of sales which forced prices down.

The Ebbing Tide

Electrical equipment shares, radio shares and, indeed, industrials of all kinds, have been severely depressed. It is claimed in the Stock Exchange that the actual amount of selling was of no great volume, but that what did come to the markets, found no buying confidence ready to absorb the realized stock, and that, in consequence, prices had to give way. In many cases, no doubt, these prices were marked down by way of protection against possible selling. The gilt-edged group went back with the rest. British Transport stock and British Electricity Threes made no exception to the trend of the Consol market.

Devaluation?

On top of all the other causes for flatness, the rumour revived that devaluation of the pound was in immediate prospect. What connection such a devaluation may have with the prices of cable and electrical companies' shares, it is difficult to say. With pronounced depression in the Consol market, however, the sympathy which prevails amongst markets as a whole is held sufficient to account for the influence it exercises over industrials. One of the few firm spots round the House is the market for Cable & Wireless stocks, where the ordinary, after its setback from 242 to 234, has held steadily to the latter figure.

A.E.I. Meeting

The Chancellor of the Exchequer complained in a recent speech about the "frightfully high" level of industrial profits: but in 1948 he made five times as much out of Associated Electrical Industries' profits as the stockholders did, and took no share of the risks. Amounts paid in dividends came to only 3d in every 20s of income. Notwithstanding the retention of most of the surplus in the business, Mr. Oliver Lyttelton could still show very good cause for deploring the depletion of industrial capital by excessive taxation. His speech brought out all the points which go to the making of a first-class industrial investment. At 75s the A.E.I. shares pay 4 per cent on the money.

Dividends and Reports

Preliminary figures for 1948 reported by the Telephone Manufacturing Co. add to the telephone group's investment reputation, already enhanced this year by others in that group. Despite, however, the doubling of the net profit, the dividend remains at the 9 per cent rate paid since well before the war. The 5s shares stand at 10s, yielding 4½ per cent. British Vacuum Cleaner 5s shares are quoted at the same figure. Profits have declined, but the dividend is being maintained at 20 per cent.

Recent Issues

The Telephone & General Trust's new 3½ per cent debentures, redeemable 1957/72, are now in the market at a price of 103½, yielding £3 7s 9d per cent. The Electric & Musical Industries recently issued 4½ per cent preference shares are firm at 23s 3d. They can still be bought free of transfer stamp, and pay £3 17s 6d per cent on the money. Calcutta Electric Supply Corporation's new ordinary shares are being dealt in at about 1s premium on the offered price of 22s 6d. The old shares are now 23s 6d, ex rights to the offer, as compared with 29s a month ago. The yield on the last dividend is equivalent to over 9 per cent, less tax at the standard rate. Babcock & Wilcox are seeking permission to make an issue of preference and ordinary capital.

Electrical Shares Stand Up

In a period of sharp depreciation, the heavy electrical engineering shares are resisting the industrial market's depression somewhat better than others. According to the popular indices, average prices have dropped to the lowest points of the year. Among the electrical shares which are standing up more firmly than this are Telegraph Constructions, Johnson & Phillips, Automatic Telephones, Cromptons, Henley's and English Electric. G.E.C. and A.E.I. also have something in hand over the lowest prices marked earlier in the year. Those which have followed the average tendency are mostly in the lighter engineering groups—E.M.I., Cossors and Ever Ready among them.

Electricity Supply

Power from Scottish Peat : Large New E. Midlands Station

IN the House of Commons last week Sir David Robertson asked the Secretary of State for Scotland whether it was his intention to conduct the large scale experimental work for the production of electric power from peat at Altnabreac where the finest quality peat was in abundance. Mr. Woodburn said he was aware of the extensive peat deposits at Altnabreac. Further surveys of Scottish peat bogs, including the collection of meteorological data and the analysis of samples with a view to assessing their suitability for burning in gas turbines, would be necessary, however, before a decision could be reached on the siting of large-scale experiments.

Scottish Estate Acquisition

It is understood that the North of Scotland Hydro-Electric Board has acquired Foss House and the Foss Estate, which lies on the south side of the Tummel east of Tummel Bridge. Foss is affected by the Tummel-Garry scheme. It was rebuilt about ten years ago by the late Mr. George Balfour, and Mrs. Balfour at present resides there.

Replacing the cover of the turbine of the 105,000 kW set at Battersea power station after the set, the largest in Great Britain, had been overhauled. (1st June, 1949)

Drakelow Power Station

One of the new stations to be built by the British Electricity Authority will be at Drakelow Park, near Burton-on-Trent, an estate now in decay, with uncared for trees and woodland. The trees will be retained; they will help to screen the station and provide a unique approach—an avenue 1,500ft long. The first half of the new station will have four 60,000 kW sets and the second half will be proceeded with immediately the first is finished. The total potentiality of the site is 860,000 kW.

Preliminary work will begin soon and tenders have been accepted provisionally for the boilers and generator plant. It is hoped to have the first two sets running by 1953.

Seaside Illuminations

Weston - super - Mare Corporation has approved a scheme for the provision of fairy lighting, floodlighting and set-piece illuminations for the sea front and public buildings at an estimated cost of £8,664, provided a loan can be obtained.

Scarborough Council has agreed that the war memorial, lighthouse and castle should be floodlighted for the ensuing season, with striplighting in the Foreshore Road, Sandside and Westborough from 1st June to 30th September. Striplighting is also planned for Peasholm Park.

French Board and Appliance Sales

The legality of sales of household apparatus by Electricité de France has been raised in a letter to the Minister of Industry and Commerce by the Presidents' Assembly of the Chambers of Commerce. It states that the law of April, 1948, nationalizing electricity, excepted from nationalization household apparatus, and forbade the sale of these by Electricité de France. Despite this, the apparatus belonging to former concerns has not been restored to them, and the nationalized industry is buying and selling new apparatus. The Assembly asks that a decision should be taken in this matter as soon as possible, consideration being given to legitimate grievances on this subject.

It is proposed to exempt from nationalization businesses which install apparatus to produce power for their own use, particularly with back-pressure turbines, and all firms installing plant for the production of up to 12 million kWh annually. Altogether 300 firms are expected to escape nationalization.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (2s each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1942

14939. Sperry Gyroscope Co., Inc.—Electric or electromagnetic transmission networks or bridges. 28th January, 1941. (623354.)

1943

1589. Sperry Gyroscope Co., Inc.—Apparatus for use in determining the direction of an object from which radio-waves are being received. 29th January, 1942. (623626.)

1944

11031. Kompfner, R., and Wright, C. S.—Electron-discharge devices. 8th June, 1944. (623537.)

12565. Telephone Manufacturing Co., Ltd., and Smith, S. J.—Impulse-operated indicating mechanisms. 1st July, 1944. (623627.)

12566. Telephone Manufacturing Co., Ltd., Smith, S. J., and Terry, R. St. G.—Impulse-operated indicating mechanisms. 1st July, 1944. (623628.)

26079. British Thomson-Houston Co., Ltd.—Starting and controlling apparatus for electric-discharge lamps. 31st December, 1943. (623359.)

1945

3119. Compton Organ Co., Ltd., J., and Bourn, L. E. A.—Electrical musical instruments. 7th February, 1945. (623725.)

4269. Hayward Tyler & Co., Ltd., Howard, G. P. E., and Ivanoff, V.—Submersible electric motors. 20th February, 1945. (623363.)

4270. Hayward Tyler & Co., Ltd., Howard, G. P. E., and Ivanoff, V.—Submersible motor and pump combinations. 20th February, 1945. (623364.)

5081. British Thomson-Houston Co., Ltd.—Systems for indicating the effective age of electrical apparatus. 1st March, 1944. (623539.)

6667. British Thomson-Houston Co., Ltd.—High-frequency heating apparatus. 17th March, 1944. (623365.)

12906. Jack & Heintz, Inc.—Electron compasses. 30th March, 1944. (623368.)

13304. Hayward Tyler & Co., Ltd., Howard, G. P. E., and Ivanoff, V.—Electric motors of the submersible type. 28th May, 1945. (623369.)

15545. British Thomson-Houston Co., Ltd.—Refrigerant compressors. 20th June, 1944. (623543.)

16359. Stevens, A. H. (Submarine Signal Co.).—Voltage regulators. 27th June, 1944. (623543.)

27305. Kemp, C. G.—Radio direction-finding equipment. 18th October, 1945. (623635.)

33751. Zellweger, Ltd.—Electrical remote-control method and system for electric circuit makers and breakers. 30th December, 1944. (Cognate applications 33752/45 and 33754/45.) (623636.)

1946

3188. Decca Record Co., Ltd., and O'Brien, W. J.—Direction indicating devices for radio signals. 31st January, 1946. (623378.)

3617. Standard Telephones & Cables, Ltd., McWhirter, E. M. S., Dunn, R. H., and Lennox, P. W.—Electric potentiometers, and remote supervisory systems. 5th February, 1946. (623379.)

3618. Standard Telephones & Cables, Ltd., McWhirter, E. M. S., Dunn, R. H., and Lennox, P. W.—Measuring and indicating equipment for use for instance in remote supervisory systems. 5th February, 1946. (623380.)

5853. Telegraph Construction & Maintenance Co., Ltd., Dean, J. N., and Smith, E. W.—Electric cables. 25th February, 1946. (623730.)

6785. Standard Telephones & Cables, Ltd., and Taylor, F. H.—Circuit-arrangements for cathode-ray tubes. 5th March, 1946. (623638.)

7319. Standard Telephones & Cables, Ltd.—Radio guiding system. 2nd April, 1945. (623382.)

8902. Philco Radio & Television Corporation.—High-frequency electrical systems employing wave guides. 15th August, 1944. (623385.)

11397. Standard Telephones & Cables, Ltd., Eadon-Clarke, C. E., and Micklewright, P. L.—Joining materials by high-frequency heating. 13th April, 1946. (623736.)

12231. British Thomson-Houston Co., Ltd.—Methods of making photoelectric cells. 24th April, 1945. (623389.)

15012. Standard Telephones & Cables, Ltd.—Flexible cable shafting and method of making. 21st May, 1945. (623740.)

15428. Marconi's Wireless Telegraph Co., Ltd.—Antenna systems. 20th January, 1945. (623556.)

15504. Soc. Française Radio-Electrique.—Systems for frequency modulation. 17th March, 1944. (623741.)

16228. Naamlooze Vennootschap Philips' Gloeilampenfabrieken.—Soldering irons. 3rd August, 1939. (623393.)

16808. Levers, J. F., and Patchett, R. V.—Electrical devices. 3rd June, 1946. (623641.)

18005. Standard Telephones & Cables, Ltd.—Voltage regulators. 6th August, 1945. (623396.)

18445. Philips Lamps, Ltd.—Electric-discharge tube circuits. 17th April, 1942. (623398.)

18803. Collard, J.—Electrical networks. 22nd June, 1946. (623560.)

20099. Tench, F. (Automatique Electrique Soc. Anon.).—Telephone instruments. 5th July, 1946. (623402.)

20340. Philips Lamps, Ltd.—Electronic tube amplifiers. 11th July, 1945. (623746.)

20801. Telegraph Construction & Maintenance Co., Ltd., Dean, J. N., and Smith, E. W.—High-frequency cables. 11th July, 1946. (623748.)

22069. Rosenthal, E. G.—Refractory cements, and supports or mounts for the resistance wires of electric heating elements. 24th July, 1946. (623565.)

24600. —Telegraph Condenser Co., Ltd., Sporing, P. A., and Johnson, C. P.—Means for assembling tubular capacitors. 19th August, 1946. (623568.)

24601. Telegraph Condenser Co., Ltd., Sporing P. A., and Johnson, C. P.—Means for delivering a number of articles in succession. 19th August, 1946. (623569.)

25564. English Electric Co., Ltd., and Abbink-Spaink, J. H.—Overspeed devices for electrically-propelled vehicles. 27th August, 1946. (623411.)

26331. Standard Telephones & Cables, Ltd., Bray, F. H., and King, P. M.—Electrical impulse translating circuits. 2nd September, 1946. (623572.)

28032. Metropolitan-Vickers Electrical Co., Ltd., Miller, C. W., and Saxon, G.—Electromagnetic wave guides. 18th September, 1946. (623756.)

28952. Standard Telephones & Cables, Ltd.—Multichannel electric pulse communication systems. 26th February, 1945. (623415.)

30015. Metropolitan-Vickers Electrical Co., Ltd., and Smith, D. M.—Gas turbine plants. 6th November, 1947. (623419.)

30956. Thermega, Ltd., and Singleton, S. A.—Apparatus for controlling the supply of electric current to the heating element of an electrically-heated device. 17th October, 1946. (623576.)

31954. Jack & Heintz Precision Industries, Inc.—Automatic voltage control of d.c. generators. 1st November, 1945. (623765.)

33284. Western Electric Co., Inc.—Electron-discharge devices and particularly magnetrons. 12th February, 1946. (623766.)

33549. Weymouth Radio Manufacturing Co., Ltd., and Jordan, B. I.—Means for tuning radio receiving apparatus. 12th November, 1946. (623581.)

33994. Boswell, I. I.—Connectors or termination members for electric cables. 15th November, 1946. (623649.)

34518. Coop, E.—Electromagnetic wave-guide systems. 21st November, 1946. (623770.)

36586. Siemens Electric Lamps & Supplies, Ltd., and Aldington, J. N.—Structures of the kind providing an hermetically sealed and electrically conductive connection through vitreous material. 11th December, 1946. (623650.)

37754. Neuber, H. K.—Modulating and control arrangements for valve oscillators. 22nd December, 1945. (Cognate application 37755/46.) (623430.)

37899. Hazeltine Corporation.—Television translating system. 25th January, 1946. (623431.)

1947

24. General Electric Co., Ltd., Beggs, S. S., and Thomas, E. R.—Lighting fittings. 1st January, 1947. (623435.)

5654. Pye, Ltd., and Spurr, P. A.—Apparatus for producing a high d.c. voltage from a high-frequency current. 27th February, 1947. (623782.)

5682. Standard Telephones & Cables, Ltd., Barnard, R. M., Wooltorton, E., and Broughton, J. Delves-.—Electrical condensers. 27th February, 1947. (623783.)

5693. Philips Lamps, Ltd.—Circuits for the production of oscillations of saw tooth or triangular waveform. 20th April, 1944. (623441.)

5694. Philips Lamps, Ltd.—Devices for controlling the terminal voltage of a load. 27th April, 1944. (623442.)

5853. Philips Lamps, Ltd.—Manufacture of electric resistances. 22nd April, 1944. (623784.)

6341. Naamlooze Vennootschap Philips' Gloeilampenfabrieken.—Method of treating the free surface of selenium electrodes. 6th April, 1944. (623459.)

6997. Morey, G. H.—Electrical heating devices and method of making the same. 20th September, 1940. (623786.)

7188. Simms, T. E.—Control systems for engine-starting polyphase induction motors. 14th March, 1947. (623787.)

7467. British Thomson-Houston Co., Ltd.—Apparatus for screen brightness measurement. 18th March, 1946. (623656.)

7537. Westinghouse Electric International Co.—Electrical current networks. 10th July, 1945. (623462.)

7576. Naamlooze Vennootschap Philips' Gloeilampenfabrieken.—Electric-discharge tubes. 16th June, 1944. (623601.)

10289. Sight Light Corporation.—Shock-resistant electromagnetic relay. 11th May, 1946. (623793.)

11890. British Thomson-Houston Co., Ltd.—Methods of protecting alternating-current electric power systems. 4th May, 1946. (623489.)

12068. Westinghouse Electric International Co.—Alternating-current arc-welding systems. 7th May, 1946. (623610.)

12069. Westinghouse Electric International Co.—Refrigerating apparatus. 10th May, 1946. (623611.)

12071 Westinghouse Electric International Co.—Refrigerator doors. 10th May, 1946. (623612.)

12163. Cole, Ltd., E. K., and Stickley, W. A.—Circuits for electric gas-discharge lamps. 6th May, 1947. (623501.)

12257. British Thomson-Houston Co., Ltd.—Electric switches. 7th May, 1946. (623505.)

12393. E.M.P. Electric, Ltd., and Dannenberg, K.—High voltage fuses. 7th May, 1947. (623621.)

12428. Taylor, Tunnicliff & Co., Ltd., and Pirie, J. H.—Electric lead-through or bushing insulators. 8th May, 1947. (623511.)

12448. Combi, A.—Automatic electrical circuit breakers. 8th May, 1947. (623513.)

12455. Rotax, Ltd., and Bourne, W. G.—Electric tumbler switches. 8th May, 1947. (623514.)

12494. British Thomson-Houston Co., Ltd., Hibberd, R. G., and McAllister, L. E.—Lighting system embodying low pressure electric-discharge lamps. 8th May, 1947. (623516.)

12495. Westinghouse Brake & Signal Co., Ltd., and Walker, A. H. B.—Control apparatus for alternating electric current circuits. 8th May, 1947. (623661.)

12554. Simplex Electric Co., Ltd., and Hunt, J. J. H.—Electric switch-boxes and conduit fittings for electric conductors. 9th May, 1947. (623666.)

12574. Philips Lamps, Ltd.—Circuit arrangements for limiting and detecting frequency-modulated oscillations. 14th May, 1946. (623668.)

12612. Wiggins Teape & Co. (1919), Ltd., and Edge, S. R. H.—Electric recording papers and the like. 9th May, 1947. (623671.)

12684. Eggleton, C. W.—Devices for maintaining electrical components in holders. 10th May, 1947. (623676.)

12748. Churchill Machine Tool Co., Ltd., and Jones, J. C. — Control of electrically-driven cross-feed mechanism of plano-grinders, plano-millers and planing machines. 12th May, 1947. (623680.)

12900. Smart & Brown (Engineers), Ltd., and Palmer, I. D.—Electric glow discharge switches. 13th May, 1947. (623687.)

12925. Wheeler, H. D., Mossay, P. A. H., and Dean, J.—Electric motor control system. 13th May, 1947. (623689.)

12963. Diamond Motors (Wolverhampton), Ltd., and Ford, W. V.—Switches for use more especially on pedestrian-controlled electric vehicles. 14th May, 1947. (623694.)

12965. Fisk, Sir E. T.—Electric dry cells. 14th May, 1947. (623695.)

12972. Westinghouse Brake & Signal Co., Ltd., and Corbyn, D. B.—Electrically operated vibrator apparatus. 14th May, 1947. (623526.)

13014. General Electric Co., Ltd., Clack, B. N., and Hills, D. S.—Circuits for electric discharge lamps. 14th May, 1947. (623529.)

13082. Pirelli-General Cable Works, Ltd., and Harding, J. R.—Tension joints and clamps for steel-cored electric conductors. 15th May, 1947. (623798.)

13307. Valensi, G.—Thermomagnetic control systems. 20th June, 1946. (623707.)

13490. Singh, W. K.—Production of polyphase electric currents. 20th May, 1947. (623713.)

13576. Smith & Sons (England), Ltd., S., and Meredith, F. W.—Protective cut-out switches for polyphase electrical apparatus. 20th May, 1947. (623716.)

13684. Siemens & General Electric Railway Signal Co., Ltd., and Ketteringham, T. A.—Fluid-operated electric treadle switches. 21st May, 1947. (623718.)

14657. Widd, T. V.—Electric immersion heaters. 4th May, 1946. (Divided out of 623392.) (623443.)

Ordnance Factory Labour Costs

Brigadier Rayner recently asked the Minister of Supply why the labour cost in the production in Royal Ordnance Factories of electrical ceramics, mining machinery and oilfield equipment in 1947-48 was, respectively, 105 per cent, 82 per cent and 72 per cent higher than the estimate.

Mr. G. Strauss said that the factories undertook this work to meet acute shortages of supplies. The type of production was a specialized one, of which they had had no previous experience.

Display at Torquay

In addition to its stand in the Torquay Convention Exhibition, the English Electric Company has an "overflow" exhibition at the showrooms of S. H. Partridge & Co., Ltd., Victoria Parade, Torquay. The items include two substation fusegear assemblies, a "Type OLX" air-insulated metal-clad unit, a demonstration of the principles of airblast switchgear and a 100 kVA distribution transformer.

CONTRACT INFORMATION

ACCEPTED TENDERS AND PROSPECTIVE ELECTRICAL WORK

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.

Aberdeenshire.—22nd June. County Council. Electrical work in 44 houses on four sites. County architect, County Buildings, 25, Union Terrace, Aberdeen.

Australia.—MELBOURNE.—31st August. Victorian Government Railways. Twelve, or alternatively thirty-two, 1,500 kW rectifier units. (C.R.E. (I.B.) 12725/49. Ten/417.)*

Bentley-with-Arksey.—18th June. Urban District Council. Electrical installations in 40 houses at Scawthorpe. R. N. Penlington, surveyor, Council Offices, Cooke Street, Bentley, Doncaster.

Border (Cumberland).—R.D.C. Electricians' work in thirty houses at Brampton, thirty-six at Longtown, and four at Smithfield. Plans by the Surveyor, Council Offices, Victoria Place, Carlisle.

Edinburgh.—4th July. North of Scotland Hydro-Electric Board. 11 kV overhead lines. (See this issue.)

Egypt.—CAIRO.—18th July. Director-General, Electricity and Gas Administration. A.c. meters and time switches. (See this issue.)

Lincolnshire.—30th June. County Council. Electric lighting installation at Bracebridge Heath School. (3rd June.)

London.—P.O. Contracts Department. Hearing aids and audiometers. (3rd June.)

Shrewsbury.—Corporation. Installation of electric street lamps. (3rd June.)

Southend-on-Sea.—14th June. Education Committee. Electrical installation at Municipal College, Victoria Circus. (27th May.)

South Shields.—Education Committee. Rewiring of the High School for Girls, Dean Road County Secondary School and the West Harton C.E. School. Specifications, etc., by the North-Eastern Electricity Board, Jesmond, Newcastle-on-Tyne.

Uganda.—KAMPOLA.—Uganda Electricity Board. Supply of distribution materials. (See this issue.)

West Riding.—21st June. County Council. Electrical installation in connection with the adaptation of Westfield House, Goole, as a dental clinic. Particulars from County Architect, County Hall, Wakefield.

* Specifications may be inspected at the Commercial Relations and Exports Department, Thames House North, Millbank, S.W.1.

Orders Placed

Durham.—County Council. Improvements to electrical installation at the Durham Assize Court (£134).—R. Robson.

Fulwood (Lancs.)—U.D.C. Complete equipment and erection of lighting of main trunk road A.6.—Metropolitan-Vickers Electrical Co.

Hull.—Corporation. Electrical installations in twenty-eight houses in Ridgeway Road (£1,215).—S. F. Hardy, Ltd.

Northallerton (Yorks).—U.D.C. Electrical installation in forty-four houses on the Vicars Croft housing site (£568).—Hardisty & Nelson.

Sheffield.—Corporation. Three electric goods lifts for the Edward Street flats schemes Nos. 1 & 2 (£2,941).—Keighley Lifts, Ltd.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Ashington.—Alterations and additions to the Ashington Infectious Diseases Hospital for the Newcastle-on-Tyne Hospital Board; J. W. Urpeth, builder, Bedlington.

Ashtead (Surrey).—Memorial homes (£50,000); British Legion Haig Homes, 6, Duke Street, London, S.W.1.

Bridgnorth.—School, Innage Lane, for Salop E.C.; Jackson & Edmonds, architects, 65, New Street, Birmingham, 2.

Brighton.—Farm buildings, including cottages, dairy, etc., Mary Farm, Stanmer Park Estate; D. J. Howe, borough engineer, 26-30, King's Road.

Factory, Hollingbury Light Industrial Estate; British Manufactured Bearings Co., Ltd., Victoria Works, Crawley.

Burton-on-Trent.—Houses (100), Manners site, for T.C.; borough engineer.

Bury St. Edmunds.—Technical institute for C.C.; county architect, 13, Westgate Street.

Chesterfield.—Permanent houses (50), in two groups, Lancaster Road North; Richard Clegg, town clerk, Town Hall.

Clacton-on-Sea.—Secondary School for Girls (£185,000) for Essex E.C.; county architect.

Darlington.—Houses and flats (280) on the Haughton South site for the T.C.; borough architect, Central Buildings.

Durham.—Laboratory buildings at Durham University for the Council of Durham Colleges; C. Elgey, architect, 7a, North Bailey.

Elstree.—Council chamber and offices, Shenley Road, Boreham Wood; houses (106), Colney Hill Estate, D. Howell, R.D.C. surveyor, Council Offices.

Essex.—Secondary school, Clacton (£190,000); H. Conolly, county architect, County Hall, Chelmsford.

Felling-on-Tyne.—Electrical equipment required for 50 houses by U.D.C; H. Fawcett, surveyor, U.D.C. offices.

Hebburn-on-Tyne.—New shot blast shed to be built and canteen to be extended at the works of the Bushing Co., Ltd.; Cackett, Burns, Dick & McKellar, 21, Ellison Place, Newcastle-on-Tyne.

Houses for U.D.C.; David Glen, Albert Road, Jarrow (40); Gustavus Bailey, Ltd., King Street, South Shields (56); J. M. Black, Junr., Black Glen Street, Hebburn (30).

Hull.—Cold stores, etc., Scarborough Road; Hull Fish Merchants' Protection Society, St. Andrew's Docks.

Houses (300), Bilton Grange estate extension, for T.C.; city architect.

Jarrow.—Extension and modernizing of the fitting shop at the shipyard of the Mercantile Dry Dock Co.; Stephen Easten, Ltd., Westgate Grange, Newcastle-on-Tyne.

Kingston-on-Thames. — Omnibus garage, Gordon Road; London Transport Executive, 55, Broadway, S.W.1.

Receiving depôt, offices, etc., Vicarage Road; Metropolitan Water Board, 173, Rosebery Avenue, E.C.1.

Leeds.—Houses (126), Ireland Wood site; W. Thompson (Contractors), Ltd., 19, Sheepscar Street North.

London.—CITY.—Large offices, Old Jewry and Princes Street, E.C., for the Bank of England; Trollope & Colls, contractors, 41, Old Great Queen Street, W.C.2.

BERMONDSEY. — Rebuilding Holy Trinity Church, Dockhead; H. S. Goodhart-Rendel, architect, 13, Crawford Street, W.1.

HOLLOWAY.—102 flats and eight shops, Pembroke Street, for Islington B.C.; H. Monson, architect, 120, Moorgate, E.C.2.

ROTHERHITHE.—Works, 183/191, Long Lane; McGorvarin Refrigerators, Ltd., 169, Bermondsey Street, S.E.1.

STOKE NEWINGTON. — Primary School (£198,650), Abney Park, for L.C.C.; Education Architect's Dept., County Hall, S.E.1.

SOUTHWARK.—Scheme for rebuilding Kennington Theatre as cinema; G. Coles, architect, 40, Craven Street, London, W.C.2.

Loughborough.—Teachers' training block (£25,000) and science block (£80,000), at College, for Leicestershire E.C.; county architect.

Maidstone.—Central bakery, Cripple Street; Maidstone & District Co-operative Society, Ltd., Stone Street.

Houses (68), Allington estate extension; Cox Bros., 27, Mote Road.

Manchester.—Adaptation of and alterations to St. Joseph's Buildings, Longsight, to form police hostel; city architect, Town Hall.

Rebuilding Free Trade Hall, Peter Street (£377,640) for T.C.; city architect.

Middlesbrough.—Primary school, Spencer Field Crescent; J. Kenyon, borough surveyor and architect, Town Hall.

Mossley.—Houses (80), Micklehurst scheme; town clerk, 38, Manchester Road.

Plymouth. — Houses (62), High Street, Budeaux, for T.C.; city architect.

Stores, etc., Cornwall Street; Marks & Spencer, Ltd., 72, Baker Street, W.1.

Portsmouth.—Departmental stores, Commercial Road; F. W. Woolworth & Co., Ltd., 1, New Bond Street, London, W.1.

Reading.—Large building for offices, club, etc., Friar and Station Street; Prudential Assurance Co., Ltd., Holborn Bars, London, E.C.1.

Redcar (North Riding).—Two schools for North Riding E.C.; Denis Clarke Hall, Education Offices, County Hall, Northallerton.

Rochdale.—Extensions to Transport Department Offices, Mellor Street; borough surveyor, Town Hall.

Saltburn (North Riding).—School for North Riding E.C.; Denis Clarke Hall, Education Offices, County Hall, Northallerton.

Sheffield.—Grammar school on site near Normanton Hill; W. George Davies, city architect, Town Hall.

Smethwick.—Extensions to brewery; Mitchells & Butlers, Ltd., Cape Hill Brewery.

Southampton.—Rebuilding west wing of art block and reinstatement of police block, Civic Centre; R. R. H. Meggeson, town clerk, Civic Centre.

South Shields.—Emporium and business premises, etc., for Jarrow & Hebburn Co-op. Society; C.W.S. Contracts Dept., Blandford Street, Newcastle-on-Tyne.

Houses (78) for Town Council at Lizard Lane; J. Reid, borough engineer, Town Hall.

Electric lighting and power at Harton C.P. School.—G. Ellis & Co., Gateshead-on-Tyne.

Sudbury.—107 flats and communal laundry, Keneric Court, Harrow Road, for Wembley B.C.; borough engineer.

Taunton.—Nursery-infants' school, Holway Estate, for E.C.; county architect, County Offices.

Warrington.—Primary school, Dallam, for T.C.; borough surveyor.

West Hartlepool.—Junior school in Seaton Lane for T.C.; Borough architect, Municipal Buildings.

Witton Park (Co. Durham).—Electric lighting and power at County School; North of England Engineering Co., Ltd., Ferryhill, Co. Durham.

Wolverhampton.—Traditional houses (200), Underhill Lane, Cannock Road; J. Brock Allon, town clerk, Town Hall.

Italian Electrical Trade

THE accompanying table gives an account of Italy's foreign electrical trade last year, together with leading suppliers and customers. It will be seen that the balance is heavily on the side of exports.

Class	Imports Lire (000)	Exports Lire (000)
Generators and motors without commutators...	116,421	2,682,300
From Sweden	11,070	—
,, Switzerland	25,546	—
,, United States ...	60,660	—
To Argentina	—	816,538
,, Brazil	—	273,520
Ditto, with commutators ...	122,600	1,518,600
From Sweden	53,760	—
,, Switzerland	27,820	—
To Argentina	—	462,600
,, Brazil	—	80,800
Transformers, static	88,855	615,020
From Switzerland	79,400	—
To Czechoslovakia... ...	—	124,500
,, Argentina	—	115,800
Unspecified elecl. apparatus ...	693,500	3,385,700
From United States ...	198,200	—
,, France	29,700	—
,, Switzerland	392,400	—
,, Britain	31,400	—
To Turkey	—	113,500
,, Yugoslavia	—	113,500
,, Poland	—	223,700
,, Egypt	—	206,600
,, Czechoslovakia... ...	—	270,200

Outstanding destinations were Argentina and Brazil for power plant, with central European countries figuring in certain lines. (The rate of exchange adopted for the official trade statistics is 400 lire = £1.)